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CONTENTS

	PAGE
Editorials	531
Letters to the Editor	536
Publications Received	537
The Scrap Heap	538
Overseas Railway Affairs	539
Japanese Government Railways	541
Keeping Abreast of the Times in the Goods Department	542
New Three-cylinder 2-6-4 Passenger Tank Engines, L.M.S.R.	547
Japanese Government Railways (Illustrations)	550
Paddington Goods Station (Illustration)	552
Railway News Section	553
American Accelerations	555
Notes and News	560
Official Notices	562

Owing to the Easter holidays, this issue of THE RAILWAY GAZETTE is published three days earlier than usual, and consequently the tables of the British and foreign railway traffic returns are held over until next week.

Reliable High Speed Service

A LETTER on page 536 of this issue draws attention to a remarkable sequence of journeys on the Cheltenham Flyer express of the Great Western Railway, which, with its booked start-to-stop average of 71.4 m.p.h. from Swindon to Paddington, is the fastest steam train in the world. In 24 runs the only material loss of time was on a day of thick fog, when, with the valuable safeguard of A.T.C., the run was still completed at an average speed of over 60 m.p.h.; on three other occasions there were trifling losses of $\frac{1}{2}$ to $1\frac{1}{2}$ min. in the running, two of which were accounted for by signal checks; and the remaining 20 runs were made in booked time or less. Many different engines and drivers were concerned in these runs, and our correspondent rightly adds that such a record proves how practical are such speeds as these on the railway, in suitable conditions. We cannot help thinking, in these days when acceleration in other countries is still in rapid progress, whereas the tide of acceleration which flowed so strongly in Great Britain in 1932 seems now to have lost its momentum, that our railway speed possibilities in this country are still far from fully exploited.

The B.B.C. and the 24-hour Clock

The decision of the British Broadcasting Corporation to adopt the 24-hour clock system in connection with its various activities will be sympathetically received by the railway world. From time to time the subject has been dealt with in these pages and it will be recalled that on December 15 last we summarised the debate thereon on Lord Newton's motion in the House of Lords. From this it was clear that the main line railway companies are perfectly ready to make the change in their time-tables on a lead from the Government, which is merely maintaining a waiting attitude until convinced that public opinion in general is in favour of the change. The B.B.C.'s experiment, which is to come into force on April 22, will be watched with very great interest and much will depend on its success or otherwise. *The Radio Times*, in discussing the proposal, urges that under the new system there will be no more confusion as regards "a.m." and "p.m." and pertinently adds:—

"We know that if we are asked to tea at 4.30 it means 4.30 in the afternoon and not 4.30 in the morning. But in such things as railway timetables it does often occur. Times after twelve are the chief cause of trouble; when you see that a train starts at '12.5 a.m.' you have got to think for a minute before you realise that it starts just after midnight. That is why Continental railways, on which there are many more all-night trains, use the twenty-four-hour system, in which 1 p.m. is called 13 hours, 2 p.m. 14 hours, and so on up to twelve midnight."

* * * *

The "Problem" of Weak Bridges

When the history of these unhappy times comes to be written, our descendants will look back with amazement, if not incredulity, and certainly with pity at the insane bickerings and illusions which fill our lives and prevent our grasping the opportunities which are at hand. Mr. Oliver Stanley devoted the better part of his speech the other day at the annual meeting of the County Councils' Association to the "problem" of weak bridges carrying roads over railways. There is a large number of such bridges in this country which, because the road system was already well developed when railways were built, had to be constructed by the latter in order to maintain the continuity of the roads they intersected. Meantime the traffic on the roads has grown too severe for them and either they must be rebuilt or the road traffic limited. But nothing can be done until it is settled how the work is to be financed. That is the "problem." We have the brains to design adequate bridges, we have the materials, we have the labour—all the physical necessities are available. Our descendants, if any survive, will have an intriguing psychological problem to entertain them in the reasons which prevented our getting on with a job that is essentially so simple.

* * * *

The Value of Technical Societies

In a brief but pithy contribution to *Service in Life and Work*, published by Rotary International, Sir Josiah Stamp discusses "Institutions and Associations: Their Place in Industry," and draws attention to the growing tendency in various branches of industry towards the formation of such bodies, some relative to an industry as a whole and others to specialised branches within that industry. There are also societies specialising in a context in which many diverse functions meet, and Sir Josiah Stamp regards the object of such bodies as of supreme importance. The outstanding example is probably the Institute of Transport, founded in 1919, and of which Sir Josiah is a Past-President and therefore well qualified to describe and discuss its functions. The Institute, fully organised and equipped, and supported by all the

various branches of transport, has brought together in pursuit of a common purpose large and diverse groups of individuals on whose co-operation and combined knowledge and enterprise the many great developments in the world of transport have largely depended. We are pleased that Sir Josiah Stamp emphasises that institutes and associations of the sort he describes can continue to do good and valuable work only providing that no unnecessary overlapping occurs, and that those in whose hands their management is vested will ensure that the qualifications for membership shall be stringent enough to exclude all but those whose practical and theoretical accomplishments entitle them to the benefits and services such membership provides.

* * * *

A Railway that Isn't

A film recently produced at an English studio shows what are apparently two trains passing each other at a railway station at relatively high speed. It was out of the question to make this scene at a station, while the bringing of actual trains into the studio would have involved the laying of at least a half a mile of track. Yet the camera succeeds in giving the appearance of reality, and this is how it was done. The London Midland & Scottish Railway co-operated by lending fittings for first and third class coaches, and with these as a guide the film company built full-sized models of four coaches. One of these was on wheels, so as to be movable, while the others remained stationary during the whole process of filming. Yet the finished picture appears to show both trains in motion, with passengers in one waving to those in another travelling in the opposite direction. Normally, effects of the kind are produced by the use of a moving photographic background or panorama that gives the illusion of a passing landscape, but the customary device has not been used here. The method adopted was to build a train of three coaches not mounted on wheels, which remained stationary inside the studio. A fourth coach, on which the camera was mounted, and fitted with wheels, was placed on rails alongside the stationary train, on the other side of which was a large "set" representing Elstree station. This "set" was also on wheels. By moving the camera coach and the "set" simultaneously—but at slightly different speeds—and leaving the three-coach train stationary, it was found that the same effect was obtained as if both trains had been moving in opposite directions. We understand that this is the first occasion on which the method has been used.

* * * *

Reviving American Passenger Travel

Some interesting details of the improvements which have been effected during the past five years in the speed of long-distance American passenger train services are set out on page 555 of this issue. Certain of the cuts in time are remarkable, such as 7½ hr. in the quickest service over the 1,386 miles from New York to the popular Floridan coast resort of Miami, bringing the overall speed of the journey up to 49.5 m.p.h. This is the more notable in that a large proportion of the journey is over single line. But all long-distance records will be smashed when the new streamlined articulated railcar unit of the Union Pacific Railroad comes into service between Chicago and San Francisco, for it is hoped to make a cut of 24 hr. in the overall time, bringing the two cities within about 37 hr. of each other, at an average speed—including the transit of the Rockies—of over 60 m.p.h. At the same time, passenger rates have seen a fall averaging 31 per cent., and considerable advances have been made in rolling stock equipment, especially in the matter of air-conditioning.

These improvements in railway travel are not being lost on the American public, for there, as here, passenger receipts took a definite turn upwards about midsummer of last year.

* * * *

New Rule Book on the Reichsbahn

When the various separate State Railways in Germany were amalgamated to form the Deutsche Reichsbahn, the rules of working were not uniform in many important respects, in spite of the general similarity of principle which characterised railway operation throughout that country. It consequently became necessary to standardise the rules and adopt uniform methods of signalling, block working, &c., as far as possible, just as had to be done by the British railways since grouping. The new "Fahrdienstvorschriften," or train operating regulations, came into force throughout Germany on September 1, 1933. They are contained in a book the 307 pages of which are about twice the size of those in our Clearing House Rule-Book. A table at the end enables a comparison between the numbers of the old and new rules relating to a particular subject to be readily made, while another sets out the various groups of rules applying to certain members of the staff, according to the nature of their work with which they are required to be particularly familiar. The issue of separate booklets, containing part of the rules, to certain ranks has with few exceptions been abandoned. Examples of all the printed forms used are now included. The rules cover many things which would be dealt with in the Appendix in this country. The new book was issued in May and lectures were given on its contents, so that by September everyone was ready for the change.

* * * *

Gravel Ballast

A paper presented before the convention of the National Sand and Gravel Association of the U.S.A. at Detroit, discussed the effect of the depression in the United States on the supply of ballast for permanent way maintenance. It appears that, whereas in 1929 about 30,000,000 cu. yd. of ballast were purchased by the railways, only 8,500,000 cu. yd. were bought in 1932. Such figures as these give some idea of the high standard permanent way in America had reached before the onset of the depression, for, despite the reduction in ballast supplied to the track, main line train services have been generally speeded up. At the same time it is improbable that the purchase of large quantities of new ballast can be postponed very much longer. In this connection the use of properly screened, crushed and washed gravel was advocated, and figures were given to show that about half of all the ballast purchased by U.S.A. railways was gravel or gravel and sand. Some permanent way engineers do not favour this type of ballast, maintaining that with it the track becomes "lively." There is little doubt, however, that in view of the very widespread use of gravel for ballast, not only in America but on the Continent of Europe, this difficulty has been largely, if not entirely, overcome, and the means of doing so have been partly the very liberal allowance of ballast beyond the sleeper ends and partly the use of mechanical tamping.

* * * *

The Safety of Trackmen

During the past six years a determined campaign has been proceeding on the Louisville & Nashville Railroad of the United States with a view to reducing the number of accidents among men at work on the permanent way. Statistics at the end of 1927 showed that 25 per cent. of

the total injuries on that system were to the men of this department, whereas they worked only 20 per cent. of the man-hours of the total staff. During a typical period, an analysis of the causes of injury showed that roughly one-half occurred in the handling of rails and sleepers, in the proportion of two rail accidents to one sleeper accident, and that most of these accidents were due to lack of supervision. The next largest group was connected with the careless use of power-driven cars for permanent way purposes, resulting in collisions with trains, with automobiles at level crossings, and other casualties. Next came injuries to men struck by flying objects, such as pieces of steel broken from tools, pieces of ballast when tamping, and so on. As regards men struck by engines or cars, while this came fourth on the list of casualties, it occupied first place as regards fatalities. The great majority of the accidents were caused by violation of one safety rule or another. By a close study of the causes of accident, and improvement of methods wherever possible, the injuries to trackmen on the L. & N.R.R. were practically halved in six years, and of the total expenditure of the railway on compensation the proportion chargeable to the permanent way department has fallen from 27 to 15 per cent.

* * *

Modern German Rail Practice

Among the details of present-day railway practice in Germany, set out in a recent article in our German contemporary, *Engineering Progress*, reference is made to developments in rail manufacture. In order to increase resistance to wear, we are told, heavy rails weighing 99 lb. per yd., rolled from high carbon steels having a tensile strength of 47.8 tons per sq. in., are now in use. But in the light of modern British rail practice, the tensile tonnage indicated is a very modest figure. For some years past the B.S.I. rail specification has demanded, with the basic open-hearth steel process, a minimum breaking stress of 46 tons per sq. in., and to-day a common average for rail tensile tests in this country is 52 to 54 tons per sq. in., associated with extension percentages of 15, 16, and even 17, in comparison with the minimum of 10 per cent. demanded. In the case of compound-cast rails in Germany, which consist of two different steels united in the ingot at a welding heat, steels up to 76 tons per sq. in. tensile strength have been used in the rail-heads, in conjunction with a mild steel of 31.3 tons per sq. in. in the web and foot. As to rail-lengths, German rails are now directly rolled in 30 m. lengths (98 ft. 5 in.), and by welding these rails together in pairs the Wannsee railway now has rails of 60 m. (196 ft. 10 in.) in use, without as yet having experienced any serious difficulties in the matter of expansion. As mentioned in a recent issue, rail-lengths far longer than these are in use in certain German tunnels.

* * *

Reducing Weight of Locomotive Parts

Weight reduction of locomotive parts is dealt with in a recent A.R.A. report of the Committee of Locomotive Construction. The reciprocating parts can be considerably lightened by the use of higher strength alloy steels and non-ferrous metals, and many metallurgical advances have recently been made in this direction. Steels of 60,000 to 80,000 lb. per sq. in. tensile strength should, it is pointed out, be replaced by those of 100,000 to 120,000 lb., effecting a saving of 30 to 40 per cent. in weight with advantageous results. It is believed that with the use of such alloy steels for connecting rods, crosshead pistons and piston rods and possibly aluminium-alloy crosshead shoes and piston rings, the unbalanced reciprocating weight could be reduced by several hundred pounds

a side. When it is realised that any addition or reduction in the reciprocating weight increases or decreases the force on the driving boxes at diameter speed (m.p.h. = wheel diameter in inches) from by 45 to 55 lb. for every pound added or removed, and changes by 64 to 78 lb., the force tending to shake the whole locomotive, it can be appreciated that even a slight reduction of weight in these parts is worth while. Furthermore, such reduction would permit the use of a lighter reciprocating balance weight which also must be multiplied by 64 to 78 to express the resultant hammer blow on structures. A suggested refinement is to cross-balance the intermediate driving wheels, as by this means an appreciable reduction in the rail blow can in some cases be effected.

* * *

A Remedy for Overloaded Suburban Lines

Where districts adjacent to large and populous centres have developed on residential lines perhaps more rapidly than had been anticipated, the difficulty of providing an adequate service of passenger trains during rush hours may in course of time become acute. An effective, if costly, solution is that of widening the lines so as to make possible a more frequent service of trains. Another is to convert the railway from steam to electric traction—again a costly way out of the difficulty. Consequently, where financial and other reasons forbid the immediate adoption of either of these measures, the only alternative is to increase the carrying capacity of the existing trains and speed them up as much as possible. In a certain case there are several junctions and some fairly long and steep grades. The trains—worked by engines built several years back, having only moderate boiler and cylinder capacities, and of course not incorporating the latest refinements of large and direct steam and exhaust passages and long-travel valves—are inadequate to cater properly for the growing traffic, yet since they cannot be increased in frequency, they must be increased in capacity and accelerated. In order to make higher speeds possible, despite the gradients and the increased train weights, more powerful locomotives would be necessary. An eight-coupled design, preferably with three single expansion cylinders and a boiler carrying a higher steam pressure, together with the modern details already mentioned, should meet the case.

* * *

New L.M.S. Three-cylinder Tank Engine

The new three-cylinder tank engines now being built by the L.M.S. for working suburban passenger trains, and of which particulars appear on pages 545 to 549 of this issue, have been specially designed for fast, short-distance traffic, calling for very high accelerative capacity. At the same time they are suitable for running on permanent way calling for comparatively low maximum stresses. The use of the 2-6-4 wheel arrangement in conjunction with three single-expansion cylinders, each of the latter having its own independent set of Walschaerts motion, and steam and exhaust passages so carefully designed as to reduce wiredrawing and back pressure to a minimum, represents an excellent assembly of modern and well-thought-out features admirably adapted to the conditions stipulated. One of the services for which these engines are destined is the heavy London, Tilbury and Southend business traffic, which should greatly benefit by their introduction. Our inspection of some of the new class during their construction in the Derby works left us very favourably impressed with the general and the detailed design, the standard of workmanship exhibited and the manner in which the enginemen's comfort has been provided for.

Internal Air Lines

FOLLOWING the operation of various air services last year, many of them of a pioneer or experimental character, there are clear indications that the present summer season will witness the establishment of a large number of regular air lines linking up important commercial and holiday centres in Great Britain. So far the small area of this country and the good main-line railway services have acted as deterrents to the establishment of internal air lines for local traffic, but more than one effort has been made to work them as feeders to the main routes to the continent. Thus Daimler Hire Limited worked an air service between London and Manchester from October 23, 1922, to April 1, 1924, as a feeder to the Paris route, but these flights were suspended on the formation of Imperial Airways Limited. With the same object the latter company for some time worked a Liverpool-Manchester-Birmingham-London service, beginning on June 16, 1930. The activities of last year were mostly confined to special cases where an arm of water made land transport circuitous. For example, Bristol and Cardiff have been connected by an air ferry since September 26, 1932, while various links between the mainland and the Isle of Wight have been made, and the Humber was spanned by a similar air line between Hull and Grimsby (worked in conjunction with a railway-associated omnibus company) beginning on July 1 last.

Similar consideration also affected the longer routes. The G.W.R. stated that the position of the Bristol Channel was a leading factor in the decision to inaugurate the first British railway-associated air service, that between Cardiff, Torquay, and Plymouth, on April 12 of last year. The Thames estuary provides the justification for the Romford-Margate line of Hillman's Airways, opened on April 8 last; the Irish Channel for the group of services operated by Midland & Scottish Air Ferries Limited, from Glasgow (Renfrew aerodrome) to Belfast, Campbeltown, and Islay; the Irish Channel also for the various summer services from Liverpool and Blackpool to the Isle of Man; and the inlets of the North Sea for the Inverness-Wick-Kirkwall route of Highland Airways Limited. This type of service is one which has already met with a fair measure of popularity and there seems to be no reason why it should not develop into a successful and permanent contribution to the national transport, especially if adequate co-ordination with railway facilities be arranged.

This year attention seems to be directed more to the operation of air lines directly competing with main railway services and many plans of this nature are reported. Two routes came into being on March 19, one twice daily worked by Provincial Airways Limited between London, Southampton, Torquay, and Plymouth, and the other, worked by London, Scottish & Provincial Airways Limited, between London and Manchester. The latter is to be extended to Glasgow on May 1. It will be recalled that a London-Plymouth service was worked last year for a few days beginning on August 25. A special feature of the new service to Plymouth is door-to-door road transport. Passengers are picked up at their homes within a 12-mile range of London and set down at their destination in Plymouth. It is reported that many of the smaller companies have been alarmed by the decision of the four main-line railway companies and Imperial Airways to form a joint airways company, and have therefore initiated negotiations among themselves with a view to the formation of a combine covering the whole country. It is to be hoped that proper steps will be taken to avoid a period of unrestricted rail versus independent air line

competition comparable with that which obtained with road transport, especially as the geographical peculiarities of Great Britain, to which reference has already been made, are such that the limited need for high-speed long-distance air transport can be provided in the best public interest only as a supplementary service to the railways.

* * * *

By Rail to Baghdad

FOR about eighty years attention has been devoted periodically to the building of an overland rail route to Baghdad and the Persian Gulf. The first tangible scheme was the famous Euphrates Valley Railway, which envisaged a line from the port of Alexandretta on the Mediterranean Sea, and for which British interests secured a concession in the eighteen-fifties. Considerable delays occurred and eventually, following the purchase of a large British interest in the Suez Canal, the scheme was allowed to drop. The plans which were most nearly realised were those undertaken under German auspices following the German Emperor's second visit to Abdul Hamid in 1898, namely, to extend the Anatolian Railway from its terminus at Konia through Aleppo to Baghdad and Basra. Connections by branch lines with the ports of Mersina and Alexandretta were planned, the course of the main line being arranged somewhat inland so as to avoid vulnerability to attack from the sea. Work was pushed forward energetically, but on the outbreak of the war in 1914 the line still consisted of isolated sections separated by the Taurus and Amanus mountains, with an additional gap around Mosul. The war gave added impetus to the efforts of the German engineers, and the final standard-gauge links through the mountain regions were completed on October 5, 1918, less than three weeks before the British occupation of Aleppo.

Within the past few weeks attention has again been directed to various plans for completing a rail link from the Mediterranean to Baghdad. As recorded briefly in our issue of February 23 last, the French authorities have decided to complete the section of the Baghdad Railway now in their hands from the railhead near Nisibin, which it had reached at the end of the war, through to the Syria-Iraq frontier. At present the Taurus express runs through to a small station, called Tel Ziouan, on the Syria-Anatolia frontier, eight miles beyond Nisibin. Passengers are taken thence by car to Kirkuk to join the Iraq Railways. This railway extension is to follow the old route aligned before the war. The Société d'Exploitation des Chemins de fer Bozanti-Alep-Nissibine et Prolongements ceased to operate, as from July 1, 1933, the working of the lines of which it had charge, and the company went into liquidation on that date. It accordingly resigned from the Union Internationale des Chemins de fer, to which it was admitted in November, 1928. Almost all the lines worked by the company have been taken over, part (479 km.) by the Société turque d'exploitation des Chemins de fer du Sud de la Turquie and part by the Société du Chemin de fer Damas-Hama et Prolongements. What effect, if any, these changes will make in the working of the international services is not yet known.

An entirely separate scheme for a railway from the Mediterranean to Iraq is that of the Haifa-Baghdad Railway of which we published an account in our issue of January 8, 1932, when the survey was nearing completion. It was then hoped that an early start would be made with this great undertaking of primary importance to Palestine and the Middle East. Since that date Haifa Harbour has been completed and great progress has been made with the Iraq pipe line, but the railway project

has hung fire. The Iraq Government authorities, meanwhile, have made a fresh survey for an alternative route through the Zerka Valley, which they are understood to consider provides a better alignment. The Colonial Office has, therefore, sent out Lt.-Col. J. K. Robertson, M.Inst.C.E., who was in charge of the previous survey, to check this alternative alignment in the field. There appears to be, however, some division of opinion between the respective advantages of a railway and a motor road. The road, it is pointed out, could follow the pipe line closely the whole way and utilise the pumping stations for the purpose of petrol supply. The cost of making the present track, which runs along the pipe line, capable of carrying heavy traffic is estimated at between one and two millions sterling, while the railway, it is stated, would cost £8,000,000. For many years past motor bus and lorry services have been run to regular schedule across the Syrian desert to Baghdad from Damascus, Beyrout, Haifa, and Jerusalem, the length of the runs varying from 570 to 666 miles according to the route taken. On the long desert section there is no properly made or metalled road, and in dry weather, apart from the ordinary difficulty of loose sand, frequent dust storms occur, while during wet weather the track becomes so soft that it is almost impassable. Various forms of special road motor equipment are constructed for this service and the latest buses to be delivered were illustrated in our road transport section of March 16. A railway, however, can obviously carry a large volume of bulk traffic more cheaply than a road, and can also serve and tap other centres of trade. Our contemporary, *The Crown Colonist*, recently expressed its belief that the potential resources and development possibilities of this great hinterland were sufficiently robust to suggest that both railway and road would probably justify themselves in course of time.

* * * *

Winning Back Traffic in Germany

IN common with most other railway systems, the German State Railway has experienced much loss of traffic in recent years, and although political and economic conditions may have had much to do with it, there is no doubt that other causes have been at work, such as the competition of other methods of transport. It is interesting, therefore, to learn from an article by Reichsbahn-inspektor A. Hoffmann in the *Journal of the Central European Railway Association*, that considerable success has attended the modern business efforts of the Divisional Management of the German State Railway at Hanover, which decided, some two years ago, to set up a special organisation for the purpose of endeavouring to win back lost traffic. This organisation was entrusted with the work of advertising the Reichsbahn's services and keeping in touch with clients, retaining those yet friendly, and obtaining new ones. No doubt many of the experiences related by Herr Hoffmann are very similar to those with which our own railway representatives are familiar. He stresses the importance of selecting the right type of man for the work of calling on traders or prospective passengers, since great harm can be done by tactless conduct in these matters, as well as by the adoption of the wrong tone when speaking over the telephone or at the booking office window. The personal touch, when conducted in the right manner, is preferable to correspondence, often enabling a question to be settled in a few minutes which otherwise might drag on for some time. Nevertheless, attention needs to be paid to the way in which communications to clients are drawn up, for a letter couched in a thoughtless style may give offence and possibly lead to loss of business. There has been a tendency in Germany

in the past to adopt the "Beamtenton" when writing or speaking to the public and, in Herr Hoffmann's opinion, this should be given up without delay.

The new commercial organisation at Hanover has been set up under the supervision of the passenger and goods traffic managers for that district, with a chief officer at Hanover itself and principal assistants at that place and at Magdeburg, Bremen, and Bielefeld. It is the duty of these assistants to furnish reports detailing their activities and the position with regard to each firm or person dealt with, so that the work can always be carried on smoothly in the absence of any particular official. As a beginning the largest firms were approached, especially where it was believed that they had been led to send their traffic by other means on account of some grievance they had had against the Reichsbahn at an earlier date. Special care was taken to find out exactly what that was, where it existed, before attempting to open negotiations. These measures are, of course, as Herr Hoffmann admits, the same as those generally followed by the commercial departments of other railway systems. It is gratifying to learn that various firms have been won back to the railway during the relatively short time that the new organisation has been in existence, although not without a great deal of discussion and bargaining in many cases. Some firms, which had been annoyed by the mistaken attitude of railway officials in the past, and the failure on their part to make any serious effort to give the facilities asked for, would not at first even grant an interview and only did so after several requests had been made. The reception accorded to the Reichsbahn's representative was often frigid to the point of rudeness and some interviews had an amusing side to them, as when a trader advanced, as a special grievance, the fact that he found the dimensions of some of the new corridor coaches not to his satisfaction and discoursed at great length on the subject. In another instance the railway authorities had, some time before, lost touch with a certain manufacturer rather than continue a discussion in which some unpleasantness had to be faced, and had in consequence lost his custom in due course. By approaching the firm again in a tactful manner and meeting the wishes expressed the traffic was completely regained.

The placing of the whole of the advertising service under the care of the new department has had satisfactory results. Advertising is a feature which, at one time, was rather neglected in some countries having state-owned railway systems, but experience has proved that a good advertising service is essential in these times, although the important thing, of course, is for advertising to be followed by corresponding performance on the part of the traffic department. A uniform style of lettering and colouring—black and yellow—has been adopted for all bills and posters by the Hanover authorities in the endeavour to associate an advertisement with the railway automatically in the public mind. The correct use and placing of advertisements is found to need some care; it is indeed surprising that a less haphazard method than at present has not long since been employed, not only by railways but by commercial undertakings generally. At Hanover it was found that the insertion of advertisements in the daily press opened the way to a better understanding, and that journals which had been consistently hostile to, and critical of the Reichsbahn could be led to modify their attitude, or even to publish articles setting forth the real position of the undertaking and the importance of its prosperity to the nation. Altogether the record is a most satisfactory one, and we feel sure that better times are in store for the German State Railway system if the efforts which have produced such good results at Hanover are continued and extended, as there seems no reason to doubt they will be.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of Correspondents)

An Operating Officer on Light Signalling

London.

March 21

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the editorial article entitled as above in your issue of March 16 reference is made to the possible eventuality of light signals for running lines being placed on the ground.

It might be as well to place on record that this is not a matter for the future, as the practice already exists on the L.N.E.R., *vide* Marylebone, where certain signals were so treated in 1923, and a more recent example may be found on the L.M.S.R. just north of Stafford.

Yours faithfully,

" SIGNAL ENGINEER "

Footwarmers

Fonthill Abbey, Tisbury.

March 21

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the interesting account which you give in your issue of March 16 of Mr. A. N. Moon's paper on "One hundred years of railway coaches," it is stated that "it was not until 1880 that footwarmers were introduced." For the credit of railway managements of the past, will you allow me to point out that this is a mistake? Possibly Mr. Moon was referring to the novel acetate of soda footwarmers which were introduced by Mr. Webb on to the London & North Western Railway in that year. The ordinary footwarmer was much earlier. I find in "Murray & Co.'s Book of Information for Railway Travellers," published in 1865, a page headed "Footwarmers" [*sic*], in which it is stated that they are "mostly boxes of oblong shape and rendered watertight. They prove a luxury to the railway traveller in winter, but the privilege of using them does not extend to other than first class passengers. . . . they are supplied at a charge of sixpence each on certain lines, and free on others."

MacDermot's "History of the Great Western Railway," Vol. II, p. 590, states that on that line footwarmers were introduced for first class passengers in 1856, for second class passengers in 1870 "and reluctantly conceded to the third in the winter of 1873."

Yours faithfully,

REGINALD B. FELLOWS

The Signal Engineer's Department

Holland Park,

London.

March 22

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Reliability is the keynote of railway signalling. To maintain signalling in perfect order necessitates a great amount of knowledge and skill not only of electrical and mechanical matters, but also of railway practice.

The majority of officials who have superseded the signal engineer (on railways which have either abolished the Signal Department or have never had a special department for such work), do not possess sufficient technical skill to execute good signal work, installations, maintenance and repair work, neither have they had the time to learn thoroughly railway practice and the meaning of safety.

To secure cheap signalling and incidentally to obtain the greatest degree of safety, the engineer must keep his signalling in a state of high efficiency. In other words, the engineer has to study the working so that by careful scheming the utmost efficiency and safety is developed at the smallest expenditure. Engineers other than those trained as signal engineers, cannot be said to possess these powers.

To overhaul a signal system demands a considerable amount of expert knowledge. It is not to be expected that the "novice" will be capable of undertaking such a task. There is the likelihood of his being called upon to perform such work at a moment's notice, as such matters do crop up from time to time. There is then the danger of vital results and untoward happenings occurring.

Practice is the best teacher in the long run, accompanied by a thorough knowledge of the subject. Those in charge of signalling on such railways who possess no Signal Department cannot be said to have such practice and training.

It is folly to have such officials in charge before they have sufficient experience to carry out even the simplest of adjustments and repairs. There is no use suggesting that such officials have made a quick study of the subject because "cramming" the brain with facts and particulars is of little use in time of trouble. Another point which should be impressed on railway managements is that of good maintenance, regular attention ensures the system from trouble. To economise in maintenance is creating trouble and cannot be said to allow of care-free safe running.

Yours faithfully,

RETRENCHED FROM SIGNALLING

High Speed Trains

Barnet.

March 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the course of ordinary business travelling I have just completed twenty-four consecutive runs on the Cheltenham Flyer of the Great Western Railway, spread over a period of about two years. On one occasion only has there been appreciable loss of time; the reason was an extremely thick fog throughout the Thames Valley from Didcot to Paddington, but in the circumstances this was perhaps the most remarkable of all the runs, as we still contrived to complete the journey of 77.3 miles—with the safeguard of A.T.C.—in 75 min. 42 sec., at a start-to-stop average of over a mile-a-minute. On another less foggy day the schedule of 65 min. was actually kept. The only other journeys on which the Swindon-Paddington schedule was exceeded by more than $\frac{1}{2}$ min. were one with a loss of $1\frac{1}{2}$ min., more than accounted for by signal checks, a locomotive loss of 65 sec. on a second trip, and a 35 sec. loss on a third, again accounted for by a signal check. On fifteen trips booked time was improved on in a greater or less degree, despite the scheduled average speed of 71.4 m.p.h. from start-to-stop. Excluding the run made in thick fog, the average actual time from Swindon to Paddington on 23 trips works out at 64 min. 21 sec., and the average net time, allowing for out-of-course delays, 63 $\frac{1}{2}$ min., with a load behind the tender averaging 235 tons (7 coaches, of 220 tons tare weight). On my most recent journey the average speed over the 35.6 miles from Shrivenham to Reading worked out at 86.4 m.p.h., with a maximum rate of exactly 90 m.p.h. at Didcot, on a practically level track; a fortnight earlier we averaged 84.1 m.p.h. throughout over the 66 miles from Shrivenham to Ealing; and on either occasion the journey could easily have been completed in the hour or slightly less had not the engine been eased over the concluding stages. These runs were made at random, on various days of the week, Saturday only excepted; thirteen different engines were concerned in them, and a variety of drivers, with none of whom was any communication made before the run commenced. I submit that in the circumstances this is a remarkable record, and points the moral that, in suitable conditions, high speed schedules are a perfectly practical proposition.

Yours faithfully,

Cecil J. Allen

(See editorial note on page 531)

PUBLICATIONS RECEIVED

Vectors for Electrical Engineers.

By E. Mallett, D.Sc. (Eng.), M.I.E.E., A.M.I.C.E. London: Chapman & Hall Limited, 11, Henrietta Street, W.C.2. 8½ in. × 6 in. 176 pp. 115 line diagrams. Price 13s. 6d. net.—The determination of currents, potential differences, and phase angles in circuits subjected to an alternating mains voltage is laborious, no matter how the work is done, and in general, students seem to manage best either by drawing vector diagrams to scale and measuring the desired quantities, or by applying simple trigonometrical rules, e.g., the sine and cosine rules, to the solution of the various triangles formed. However, when a man specialises in this kind of work, giving a great deal of his time to circuit calculations both easy and complex, he will need to make himself familiar with the best tool for this purpose, namely, the algebra of complex quantities. As long ago as 1897, Dr. C. P. Steinmetz published a lucid treatise on "The Theory and Calculation of Alternating Current Phenomena," in which full use was made of the complex quantity or symbolic method of representing vectors. Dr. Mallett's book is a more compact and more up-to-date treatment of the same subject, and it has the great additional virtue of containing at the end of every chapter exercises to be worked by the reader. The numerical solutions are given at the end, making the book self-contained and very suitable for private study. The author is careful to indicate the differences between the vectors of the electrical engineer and the vectors encountered in the study of mechanics. This and other instances of care have made the book less liable than most to cause confusion by raising questions without answering them. The text and diagrams are boldly printed and there is a very complete index at the end.

The Ideals of a Student. By Sir Josiah Stamp, G.B.E., LL.D., D.Sc., F.B.A. London: Ernest Benn Limited, Bouverie House, 154, Fleet Street, E.C.4. 9 in. × 6 in. 240 pp. Price 8s. 6d. net.—Having had occasion to address students on several important ceremonial occasions, the author was able to put his hand on much of the material going to make this book by referring to his past speeches. Some of these—for instance, those worked up into the chapters "On Research," "On Proving all Things" and "On Intellectual Integrity"—are of undoubted value, and upon the student who is sufficiently far advanced to be something of a philosopher they will be certain to make a strong and lasting impression. To the average technical school student, however, it is to be feared that most of the author's topics will never mean anything, for the desire to see many different observations form a whole comprised of mutually consistent parts—

a desire which sets the more earnest man systematising his stock of knowledge until all is orderly and unforgettable—is lamentably rare. Discovering things, verifying things and fitting things together to make them parts of one another is an occupation in which professors still find much delight, but among the students of to-day an ideal, to appear really worthy of their consideration, must give them the right to wear a badge, or their favourite-hued shirt. The author only touches upon the important question of shirts in a witty reference to their bacterial content, though there are chapters "On the Economic Outlook" and "On the Democratic Hope," and here some indication might have been given of the probable outcome of the widespread modern tendency to substitute a passion for these garments for the old-fashioned allegiance to national flags. Exhibiting no tendency to "go shirts" on anything himself, but seeing a little good in most creeds, the author judiciously mixes all the colours of the spectrum (all and more than are worn at present), and thus justifies his own frequent public appearance in a garment of benign white.

Verzeichnis der Dampflokomotivgattungen der Deutschen Reichsbahn mit einer Einführung in das Lokomotivzeichnungswesen (List of the Locomotive Types of the German State Railway, with an introduction to Methods of Locomotive Classification). 6 in. × 8½ in. Pp. 51. 3rd Edition, 1932. **Die Einheits-Lokomotiven der Deutschen Reichsbahn im Bild** (The Standard Locomotives of the German State Railway, illustrated.) 6 in. × 8½ in. 4 pages of text, 1 table and 14 photographic plates. (3rd Edition, showing the position at the end of 1929.) **Die Elektrischen Lokomotiven der Deutschen Reichsbahn im Bild** (The Electric Locomotives of the German State Railway, illustrated.) 6 in. × 8½ in. 6 pages of text, 1 table and 24 photographic plates. 2nd Edition, 1930. **Die Triebwagen der Deutschen Reichsbahn im Bild** (The Railcars of the German State Railway, illustrated.) 6 in. × 8½ in. 6 pages of text, 1 table and 17 photographic plates of railcars, including multiple-unit electric trains. First Edition, 1930.—All the foregoing are published by the Transport Section of the German Students' Associations, Darmstadt, and form part of a series called "The Rolling Stock of the German State Railway, Illustrated." (Die Fahrzeugen der Deutschen Reichsbahn im Bild.) Their object is to bring into handy form the most interesting details concerning the types of vehicle described. The first on the list is the most interesting technically, and contains a great deal of valuable information for the student of locomotive development and design. The situation with which it deals is rather complicated, as the locomotives

of the various State systems now comprising the Reichsbahn were of all sorts and sizes, and there were great differences between them, which it is here sought to reduce to some degree of system. The methods of indicating, by reference letters and numbers, the wheel arrangements and other features of each class of engine were also different in the various States, and these are here compared with the standard system now adopted for the unified lines. The other booklets each contain a short account of the vehicles in question, with historical notes and tables of comparative dimensions. The series is well illustrated throughout.

Ten Years of Progress. London: Southern Railway, Waterloo Station. 7½ in. × 5 in. Pp. 32.—The alternative title given to this pamphlet, which reviews the period 1923-32, is "Keeping the Southern Up to Date," and the facts and figures set out in the text go to show that the Southern has done even better than merely keep up to date during the past ten years, for it has courageously attempted wherever possible to plan for the future. Created by the Railways Act, 1921, the company derived its heritage from the late L.S.W.R., L.B.S.C.R., S.E.R., L.C.D.R., and various other smaller railways, most of which had had to bear exceptionally heavy burdens during the four war years. Since January 1, 1923, however, when amalgamation became an accomplished fact, £25,000,000 of new capital has been invested in improvements and new works. Extensive electrification schemes have been, and still are being, undertaken; rolling stock, station property, signalling, and permanent way have all been markedly improved, while, in addition, the company has spent no less than £4,800,000 on the new works which are developing the usefulness and popularity of Southampton as a port. Impressive also are the improvements that have been made in the cross-Channel services, the company having built no fewer than 29 new ships for this purpose during the ten years under review. As regards the much discussed question of the economics of electrification there is one significant passage deserving particular attention which runs as follows: "Although railway travel generally has decreased during recent years, it is significant that the only increase recorded is in the area served by the electric lines."

Furnaces and Equipment.—The Incandescent Heat Co. Ltd., of British Mills, Cornwall Road, Smethwick, Birmingham, submits an illustrated brochure giving a comprehensive survey of the firm's range of products. This is intended as a bulletin of information regarding the scope of the firm's activities rather than as a catalogue, and includes views and descriptions of notable complete furnace installations. The Incandescent Heat Company constructs furnaces for firing by all fuels and for all industrial and engineering purposes.

THE SCRAP HEAP

At Berlin a woman pulled the alarm-signal of a railway-carriage because she didn't like the face of the man sitting opposite her. We have often travelled with faces like that, but could never afford the five-pound fine.—From "Punch."

A troupe of Japanese acrobats was stranded one Sunday morning at York station. Noticing them a porter remarked admiringly to his mate: "Clever little chaps them Jaaps, maakin 'a mint o' mooney on t' 'Alls." "Aye," replied his companion, "may be they'm smart, boot they didn't knaw enoof to chaange at Low Moor for Bradford, and so they're stook 'ere all daay.—From "The Morning Post."

At an up-country wayside station in India, the driver of a goods train recently over-ran the fouling mark and burst through a pair of points. The accident report submitted by the Assistant Inspector—a stout little fellow who knows his job, but is somewhat weak in his English—contained the following:—"The driver of 22-35 down goods, marched on and on, passed fouling mark, hence a bursting of point."

In the same district a stationmaster wrote in officially to his District Traffic Superintendent, the letter being headed "Fear of Death." In it he reported that his outer signal lamp had gone out and none of his staff of three porters would volunteer to go out and relight it, as the area—to use the description of a level crossing keeper in it—is "Home of Tiger."—Contributed by "Signals."

AN ECHO OF STEPHENSON

George Stephenson was much interested in the promotion of the Great Western branch to Oxford for the purpose of finding a wider market for his Clay Cross coal business, although the route he suggested for the railway through Moultsford and Wallingford to Magdalene Bridge was not adopted. Writing from Tapton House to Mr. Charles Saunders, the Secretary of the Great Western Railway Company, in July, 1842, he says:—

"I hope you intend to propose a line of railway from the Great Western Railway to Oxford for the next session of Parliament. If you make a single line it could be made for very little money, the country seems so extremely favourable. I think I dare almost venture to guarantee 2½ per cent. for my coals alone, as I am convinced I could supply Reading and a wide district in that quarter with cheaper and better coals than any they get at present. I have just met with a new bed of (Clay Cross) coals superior to any I have yet had. I shall be at the

London station either Monday afternoon or Tuesday morning next. I hope I may have the pleasure of seeing you to talk over the line to Oxford."

FRITH'S "PADDINGTON"

A dealer friend in New Bond Street showed me a passage in Frith's reminiscences yesterday, in which the artist revealed that he sold his picture "The Railway Station" (Paddington when very young) to an engraver for £4,500 before it was painted! It is, I find, one of the most discussed pictures at Burlington House just now.

The autumn of 1860 was taken up by studies for the picture—chalk drawings of separate figures and groups. Frith showed a sketch of the whole to Flatow, who eagerly made the offer. At first Frith reserved the right to exhibit the picture at the Royal

Academy—a right he afterwards resigned for a further £750.

Frith spent the whole of 1861 on the picture, and it was not completed until March, 1862, though he worked incessantly. That year it was exhibited; and 21,150 people paid for admission in seven weeks—five hundred a day.

The artist proudly records that every object in the picture, living or dead, was painted "from nature—often imperfectly enough as the picture proves." He employed a multitude of models, including the detectives Haydon and Brett, who, in the picture, are seen arresting a criminal on the eve of escape. "They were admirable sitters," says Frith, "and when I complimented them on their patience they took small credit for doing for me what they had often done for criminals of a deeper dye, namely, standing on the watch, hour after hour, in the practice of their profession, waiting for a thief or a murderer."—From "The Evening News."

Shunting Problem—Another Solution

We have received from Mr. Hockley, of Trichinopoly, South India, two new solutions to the Canadian Shunting Problem published on this page in our issue of January 19, together with a criticism of that originally submitted by its propounder, Mr. Lloyd. Mr. Hockley says:—

With the shunt movements detailed, the rear nine cars of train C, with caboose, became the leading nine cars in the reformed train and, therefore, the formation is entirely changed round and the caboose of train C is found in the middle of the train when the shunt movements are completed. It must, therefore, be assumed that the first nine cars have been left by train A unattached on the main line prior to the second forward movement of train A. Apart from this, the description appears to be correct.

With Mr. Lloyd's method, however, train A performs 10 shunt moves and engine C 32 shunt moves. The following alternative method reduces the shunt moves of train C from 32 to 8 but increases the shunt moves of engine A from 10 to 13, producing a total saving of 21 shunt movements:—

A backs up his train and C enters the spur with nine cars. A draws ahead clear of the switch and C runs out of the spur up the main line to the east. A backs and places the second nine cars of train C in the spur, backs, and runs forward clear of the

switch. C backs, picks up the second nine cars from the spur and draws ahead up the main line. A and C carry out similar shunt moves for the third and fourth sets of nine cars.

Another method, with a total of 25 shunt movements, (A 16 and C 9) is as follows:—

The engine and first nine cars of train A enter the spur. The switch is then closed and train C is drawn ahead clear of the switch by at least nine cars, pushing the remainder of train A backwards down the line. The engine of train A then backs out and attaches the first nine cars in rear of the caboose of train C and re-enters the spur. Train C then backs down the main line past the spur, leaving the remainder of train A where it is. The engine of train A next backs out of the spur, picks up the second nine cars and re-enters the spur. Train C draws ahead clear of the switch, leaving the first nine cars on the main line. The engine of train A again attaches the second nine cars to the caboose of train C, re-entering the spur to allow train C to back the second nine cars and attach them in rear of the first nine cars. The same procedure follows for the third nine cars and the last three cars, the final movement being the forward shunt of train C, with train A complete in rear, for the attachment of the engine of train A from the spur.

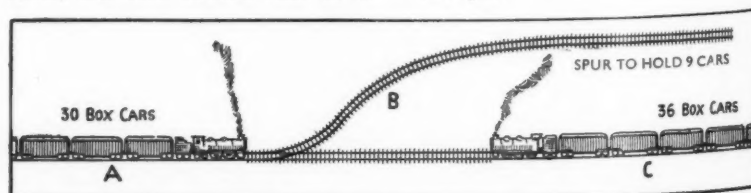


Diagram showing two freight trains meeting at junction with spur B

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Conditions under which unemployed will work for the South African Railways—Indian open line 1934-35 programme—The language question in China—Protection against uneconomic competition in New Zealand—New Latvian railways and locomotives

SOUTH AFRICA

Floods Stop Trains to Windhoek

Due to the floods and serious wash-aways in South West Africa, Windhoek was completely isolated from De Aar for many weeks at the beginning of the year. Trains from the Union were run only as far as Kalkrand.

Union Airways Contract

The agreement between Union Airways Limited and the Union Government, by which the Railways and Harbours Administration has taken over the company's undertaking as a going concern, was tabled in the House of Assembly on February 26. There is a proviso that the total amount to be paid by the administration shall not exceed £50,000, but the administration provisionally agrees to take over the rights and obligations of Union Airways under a contract with Junkers, for the purchase of three aeroplanes and 18 aero engines, at a cost not to exceed £82,600. The taking over of air services by the administration of the South African Railways was commented upon in the editorial article which appeared in THE RAILWAY GAZETTE of February 9.

Relief for Unemployed

The railway administration's scheme for dealing with unemployed, involving an expenditure of £10,000,000, is to be started in the Cape Province on work likely to take from three to five years. Preference is to be given to men under 35 years of age who have large families. The wages of the men are to be 5s. a day and, in addition, they will have the following advantages: free housing, medical services and a bonus at the end of a year, representing altogether 8s. 6d. a day and all necessities of life at or near cost price. The department proposes to erect a model village consisting of three and four-roomed semi-detached houses, with a school, public hall, sports ground and other amenities, with free water and sanitary services. The labourers will be entitled to privilege railway tickets after three months' service and annual free passes after twelve months' service. They will be entitled to five public holidays on full pay, and after a year, in addition, will have the same privilege as European labourers, of twelve days' holiday with-

out pay. The men will not be encouraged to remain longer than three years and will be entitled to a bonus of £15 at the end of the first year, £20 at the end of the second year and £25 at the end of the third year.

INDIA

Open Line Works in 1934-35

The total expenditure on open line works provided in the budget for 1934-35 amounts to Rs. 997.43 lakhs, being distributed to the extent of Rs. 395.59 to Capital Works and Rs. 601.84 to Depreciation Fund. The policy of strengthening both tracks and bridges will be continued in the coming year and, though on account of the general financial stringency the programme has still been somewhat curtailed, a total provision of Rs. 476.33 lakhs has been made for renewals of track. This sum represents an increase of Rs. 57½ lakhs over the corresponding provision in 1933-34 in order to make up arrears.

Programme of Bridgework

The provision for girder renewal and bridge strengthening amounts to Rs. 213.49 lakhs, which is about Rs. 104½ lakhs more than the amount allotted under this head for the current year. The expenditure includes a sum of Rs. 27 lakhs in respect of the reconstruction of the Nerbudda bridge at Broach, on the Bombay, Baroda & Central India Railway, work on which is already in hand. A sum of Rs. 11½ lakhs has been allowed for the reconstruction of the Sind and Chambal bridges on the Great Indian Peninsula Railway, undertaken in pursuance of the policy of bringing up to main line standard the North East line between Itarsi and Agra. On the Eastern Bengal Railway there is provision for rebuilding the Gorai bridge already referred to in these columns. The budget provides for an expenditure of Rs. 108 lakhs for the repairs and additions to the protection works of the Hardinge bridge, and for establishing ferry services across the river if that should be necessary during the next flood season. The expenditure is necessary to enable the work to be completed before the period in question. A small provision is made for the work of extending the guide bunds of the Sutlej

River bridge at Giddarpindi, North Western Railway, which had to be undertaken as an emergent work during the current year. On the East Indian Railway, allotments are made to the extent of Rs. 5½ lakhs and Rs. 4 lakhs respectively for the construction of the Adjai bridge and for additional waterway in the east approach bank of the Lower Sone bridge. The latter work is required to provide relief for the bridge, the foundations of which are shallow and the waterway insufficient to cope with the floods now passing through it.

Traffic and Locomotive Requirements

Traffic facilities for which a sum of Rs. 97.98 lakhs is budgetted include the work of doubling the Tundla-Etawah section of the East Indian Railway, now practically completed, and certain important re-modelling works. Work will be continued on the remodelling of Hubli station yard and on the new locomotive yard at Salt Cotaurs on the Madras & Southern Mahratta Railway. A sum of 38.21 lakhs is allowed for expenditure on amenities for passengers, of which Rs. 28.49 lakhs will be spent on additions and betterments to lower class carriages. The expenditure provided for the benefit of the staff includes 25.44 lakhs on staff quarters and Rs. 24.23 lakhs on welfare works. The amounts budgetted under Electrical Installations, and Signalling & Interlocking are respectively Rs. 35.68 lakhs and Rs. 24.13 lakhs.

A small expenditure is provided for the completion of work on the Dohad workshops on the Bombay, Baroda & Central India Railway. Work on the Perambur workshops on the Madras & Southern Mahratta Railway is also expected to be completed in 1934-35. The remodelling of the East Indian Railway workshops at Jamalpur is required to meet the pressing demand for the earliest possible provision of shop and crane facilities for dealing with the heaviest classes of locomotive engines, boilers and tenders, and to concentrate at Jamalpur heavy repairs of engines on account of favourable labour conditions prevailing there. The cost of the re-modelling is estimated at Rs. 25 lakhs, of which a sum of Rs. 10 lakhs will be provided during the coming year. The plant in the power house of the Bengal-Nagpur Railway workshops at Kharagpur is now nearing its limit of useful life and is inadequate to meet the present increased requirements. Its replacement is, therefore, imperative, and is also expected to prove a measure of economy. A provision of Rs. 11½ lakhs has, accordingly, been made for this work in 1934-35, leaving a balance of Rs. 3 lakhs for completion during the following year.

C.P. Coal Freight Raised

During the debate in the Assembly on the Railway Budget, Sir Joseph Blore announced that the basic rate of railway freight for Central Provinces coal, which has hitherto been lower than the rate applicable to Bengal coal, would be raised from April 1, 1934.

The new scale of freights which has since been announced is compared below with the old rates:—

NEW SCALE			
First 300 miles ...	0·10	pie	per maund per mile
301 to 500 miles ...	0·066	"	"
Above 500 miles ...	0·050	"	"
OLD SCALE			
First 200 miles ...	0·10	pie	per maund per mile
201 to 500 miles ...	0·06	"	"
Above 500 miles ...	0·045	"	"

CHINA

Canton-Kowloon Railway

The negotiations which have been taking place for some time concerning the terms of the Canton-Kowloon loan agreement have so far had no definite result. According to the Chinese press "the British have declined to make any revision," and the negotiations have therefore ended in failure. If this be so it would seem that the revision desired by the Chinese is one that could not be conceded without undermining the interests which the British side has to safeguard. The British have throughout shown every desire to accommodate the wishes of the Chinese, and many concessions have been made in the interests of friendly co-operation. Any revision must have due regard, however, to the interests of the investors and the security of their holdings, and the British side must retain such control as is consistent with its obligations.

Foreign Languages on Chinese Railways

An order has been issued by the Ministry of Railways directing that foreign languages are not to be used in the official documents of the Chinese railways and the Chinese language is to be used. Hitherto, the languages used on the different railways have usually followed the nationality of the loan service, and the more important official documents in Chinese are generally accompanied by a translation in the foreign language in use on the particular line, thus avoiding misunderstandings where the meaning might otherwise be obscure. Unlike the spoken language, written Chinese is used universally. But for the foreigner the characters take years to memorise, and it is a work of art to produce them in uniform size with the many important variations which give them widely different meanings. The writing is commenced at the top right hand corner and follows down the sheet in perpendicular columns from right to left. In these days when typed copies of letters are retained in railway correspondence the Chinese method is at a disadvantage as every extra copy has to be written out. There are typewriters with Chinese characters but they are not so speedy as the ordinary machine and have not been adopted for general use to any large extent.

It is not possible, of course, to telegraph Chinese characters by ordinary

telegraph although there is now the Marconi wireless method which reproduces them by a photographic process. The ordinary telegraph is in use, however, and a telegram written in Chinese has to be telegraphed by code numbers, foreign numerals being used. Time is taken up at both the forwarding and receiving ends in tracing each character in the code book to obtain the appropriate number and in decoding on receipt. To despatch urgent wires by this means in the case of a railway accident would cause serious delay, and it is hardly probable that the more direct means of using a foreign language would be discarded in cases of such urgency.

Another difficulty in the sole use of the Chinese language is the absence of equivalent technical terms applicable to the many foreign articles and systems now in use in China, many of which are found on the railways. The conversations in Chinese of Chinese railwaymen are interspersed with foreign technical terms in the absence of Chinese terms which would have to be coined specially, and this is hardly feasible.

Precautions against Banditry on Railways

The attack by bandits upon a train travelling on the Tientsin-Pukow railway early in January has been viewed very seriously by the Chinese Government and precautions are being taken against the possibility of a repetition. It would not be possible adequately to guard the miles of line in open country through which it passes, but additional protection will be given by increasing the number of armed guards on the trains. The trains are being fitted with alarm bells and field telephones will be carried by the guards. Regulations have been drawn up by the Ministry of Railways, and to safeguard the Shanghai-Peking expresses—against which it was thought the bandits intended to make the attack in January—pilot trains will be run on certain parts of the journey. Plain-clothes detectives will accompany the trains and there will be an inspection of passengers to prevent bandits boarding the trains in the guise of ordinary passengers.

NEW ZEALAND

District Transport Boards

Work in connection with the licensing of freight services throughout the Dominion is proceeding apace. The railway Traffic Managers in the various districts have collected a mass of evidence and facts relating to the running of competitive services, commodity rates, and traffic densities, and all this information is being sifted and weighed by the District Licensing Boards when considering the applications of road operators. Gradually an efficient system of complete control is being

hammered out which will prevent future reckless competition in New Zealand transport, and secure to licensed road operators and to the railways a measure of protection against uneconomic competition. In the present battle the railway authorities are certainly not having it all their own way, but they have been able to record some notable victories. When all licences are finally settled more time will be available for preparing competitive campaigns for traffic within the bounds of the licences.

LATVIA

Position at Close of 1933

Like all others, the railways in Latvia suffered from the world depression in 1933, revenues for the first eight months in that year being equivalent to 29·55 million lats a year as compared with 30·2 million in 1932 and 39·1 million lats in 1931, according to the Department of Overseas Trade report on economic and trade conditions in Latvia, November, 1933. A new narrow gauge line some 60 km. long between Libau and Alsunga was opened during 1933, and the first 20 km. of the Riga-Carnikava construction have been opened. On this section is the Jugla canal bridge near Mangali, the construction of which cost about £82,000 (Lats 1,400,000), the contractors being Weiss & Freitag, of Berlin, and a Czechoslovak firm. In December last three locomotives of a special type were ordered from Poland at a cost of approximately £5,650 each. Tenders have been invited and received for the construction of a girder bridge near Dwinsk, the estimated cost of which is some £38,000.

GERMANY

High Speed Railcars

Due to the satisfactory results of the Flying Hamburger, especially from the operating point of view, the German State Railway Company has decided gradually to introduce similar railcars on 22 main lines with a total length of 9,271 km. The average speed of FD trains (the principal expresses) will thus be increased from 69·5 km.p.h. to 102·5 km.p.h. To provide a sufficiency of reserve stock, 40 high speed railcars will be built for the State Railway Company, thus giving another impetus to industry.

Flying Hamburger Trials

The German State Railway recently carried out some trial runs with the Flying Hamburger between Berlin and Nordhausen. The object of the tests was to ascertain the extent of the permissible increase in speed on curves with vehicles having a low centre of gravity. The trial indicated a safe increase in speed of 20 to 30 per cent. above the present normal maximum of 75 m.p.h., and on straight lines and curves of very large radius, speeds of 105 to 106 m.p.h. were attained.

JAPANESE GOVERNMENT RAILWAYS

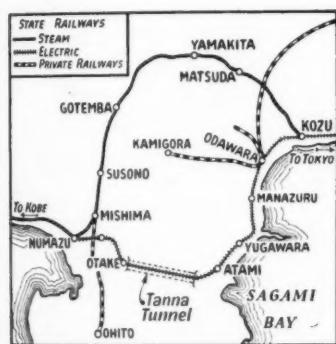
Recent activities include the boring of a great tunnel

THE commencement of the Japanese Government Railways dates back to 1869, when a trunk line was proposed between Tokio and Kobe. Constructional work was begun during the next year, thanks to a loan floated on the London market by an Englishman, Horatio Nelson Lay. The system now consists of 15,267 route km. and 24,993 track km. of 3-ft. 6-in. gauge line, which includes a number of the older private lines bought up by the Government. The Tokio-Kobe section forms the most important line on the main island, and is known as the Tokaido route.

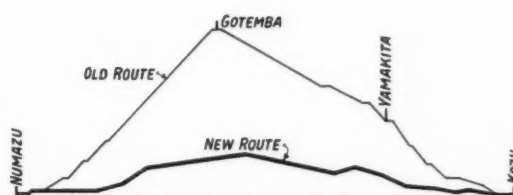
It was the abnormal operating cost of a heavily-graded division of this line which led to the greatest feat in

50 cu. ft. per sec. A 6 ft. by 5 ft. drainage tunnel running below and to one side of the main structure was constructed over much of the length, and on striking a big leakage work was stopped and the men withdrawn until the water cleared off through the drainage bore. The abnormal leakage was due to the volcanic nature of the ground, lakes forming in the basins and ancient craters, and percolating through to the tunnel beneath.

On the score of expense, the idea of two single-line tunnels was given up in favour of one large bore, the section of which is shown in one of the accompanying illustrations. Although boring operations have been finished, the tunnel is to be lined throughout in concrete,

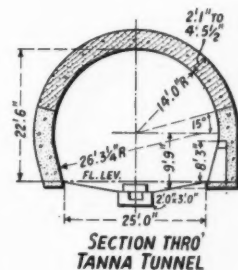


Map of new deviation, Tokaido route



ROUTE	LENGTH OF ROUTE, MILES	MAX ^m GRADE	LENGTH AT MAX ^m GRADE, MILES	LENGTH AT 1 IN 100 GRADE, MILES	MAX ^m HEIGHT ABOVE SEA FEET	MIN ^m CURVE, CHAINS	TOT ^m LENGTH AT MIN ^m CURVE, MILES	RELATIVE COAL CONSUMP ⁿ
OLD	37.5	1 in 40	12.1	31.7	1,499	20	6.3	3.3
NEW	30.3	1 in 100	7.3	7.3	259	20	3.0	1.0

Profiles of old route and new line through Tanna tunnel



Japanese railway engineering, viz., the boring of the Tanna tunnel. As may be seen from the accompanying map, the Tokio-Kobe trains leave the coast at Kozu, 50 miles out of Tokio, and rejoin it at Numazu, 37 miles further on. This section has long grades, totalling 12 miles, of 1 in 40, and serious difficulty has been for many years experienced in the operation of the principal trains on express schedules.

In view of the increasing train weights, it was decided some sixteen years ago to construct an alternative line which would run from Kozu to Numazu by a more southerly route, which, although not a great deal shorter, would have a maximum grade of only 1 in 100. This scheme necessitated boring a tunnel some five miles long through a volcanic region, and the difficulties met with in carrying out this work were far in excess of those estimated, and have led to the expenditure of approximately 100,000,000 yen spread over a period of 15 years. The boring was finally completed some few months ago, when Mr. Mitsuchi, the Minister of Railways, fired the last shot by pressing a button in his Tokio office.

The relative profiles of the old and new lines are shown in the second of the accompanying illustrations, together with particulars of the grades and curves. The gradients within the tunnel range from 1 in 440 to 1 in 310, with a short level stretch in the centre. The variable material caused much greater trouble than the boring of the longer (31,890-ft.) Shimizu tunnel on the main east to west route, which was completed in the early part of this year, and which was pierced through solid rock. Water leakage formed the principal trouble in the boring of the Tanna tunnel, the rate of leakage at some points rising to

and this work is still proceeding. On completion the permanent way will be laid, and electrification carried through to the west side of the tunnel, so that the Tokaido trains will be electrically hauled from Tokio to Numazu, instead of to Kozu as at present. The Kozu-Atami section is already converted to 1,500 volts d.c., and the total electrified route mileage of the Japanese Government Railways is now approximately 265.

New Rolling Stock

The main expresses between Tokio, Kobe, and Shimonoseki are scheduled at overall speeds in excess of 40 m.p.h., and the Sakura express is probably unique among crack trains in that it carries third-class passengers only. Dining and observation cars are included in the make-up of all the daytime expresses between the capital and Kobe, and on the night expresses all-steel convertible third-class sleeping cars with 52 berths are used, in addition to the normal first-class saloons. The third-class vehicles tare 33 tons, and when in use during the day, seat 88 passengers.

Fish traffic over the Government lines now amounts to over 600,000 tons annually, and with a view to meeting the increased demand for fresh-water fish, a number of live-fish vans have recently been introduced. Four separate tanks are housed in an all-steel body, and, although they are interconnected, any tank may be cut out of service, or withdrawn through centre doors without disturbing the sides of the van. Each van has an attendant, who looks after the aeration system. These vans run long distances, and the average haul of the whole fish traffic on the Government lines is 265 miles.

KEEPING ABREAST OF THE TIMES IN THE GOODS DEPARTMENT*

By H. W. PAYNE.

Assistant to the Chief Goods Manager, G.W.R.

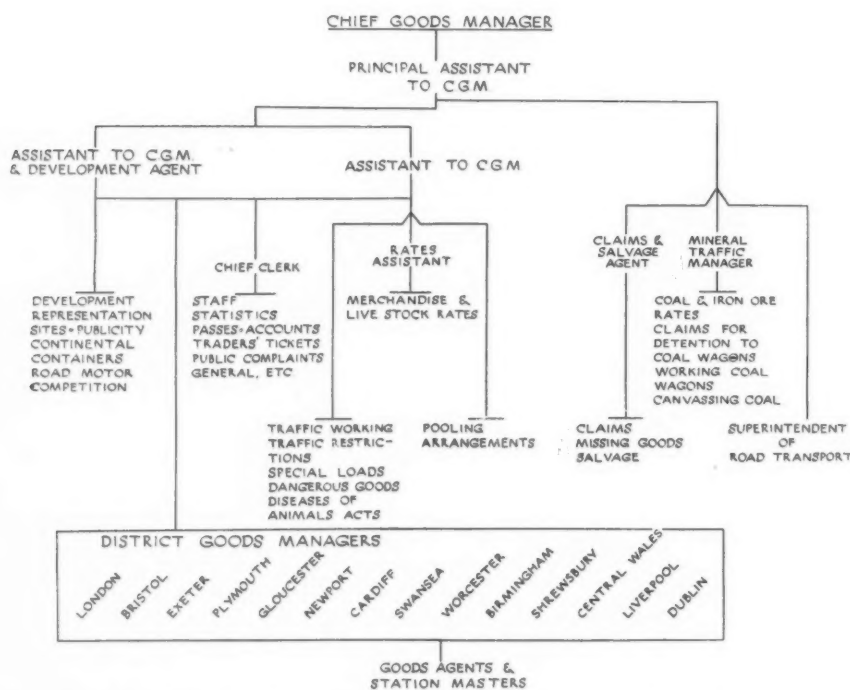
Part I

THE Goods Department of the Great Western Railway is essentially commercial, being a business-getting section of the railway and much preoccupied with business problems arising from contact with the trader—either from the trader's initiative or from the railway approach—in which both business and railway are inter-

account. The conveyance can, and sometimes does, exceed the value of the article marketed, and here you have an important factor in economics which spreads itself universally in a country not rationalised, under which millennial arrangement all trades and all industries would find separate and selected locations, and all trans-

port be co-ordinated to move traffic the shortest possible distance between origin and consumer. Commencing then with the existence of journeys of "astronomical" figures nationally, the competitive element within industry, and its sources of supply and demand, you find the Great Western Railway producing a monetary enhancement of values by charging for transport at so much per ton.

ORGANISATION OF CHIEF GOODS MANAGER'S OFFICE



dependent and strive in their respective vocations to earn a living.

Considering first the subject of rates and charges in relation to these problems, it must be stated that rates are one thing and charges another. Rates are the fixed amounts for specific journeys between two points; charges, those which, under the heading of tolls, are applicable where the rates structure is not appropriate to the transaction. The use of tolls, which were common when railways were in their infancy and merely provided a way upon which privately-owned vehicles could travel, is still standard practice for short distances or local arrangements within prescribed areas not involving a conveyance proper. Rates, however, preponderate and call for knowledge of their evolution upon a classification of commodity basis and the perpetual and fundamental principle that such classification of commodity should produce charges that the traffic could bear.

A little enlightenment follows from the oft-quoted reference to the difference in the price of any commodity compared with its cost of production and its selling price to the consumer after transit cost has been taken into

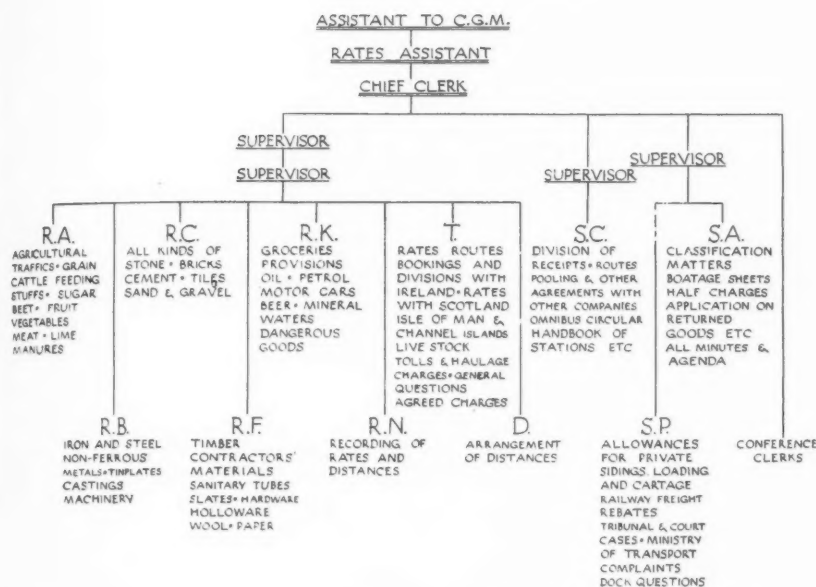
* This article is based on a comprehensive paper recently read by the author before the G.W.R. (London) Lecture and Debating Society.

the varying powers contained in over 900 Acts of Parliament which formed the basis of railway charging for over half a century; the common classification of 7 classes introduced by the railways in 1852; the Railway and Canal Traffic Act of 1888, requiring a revised classification and schedule of maximum rates and charges, which eventually became law by the Railway Rates and Charges Orders Confirmation Acts, 1891-2; and the commotion occasioned by the exercise of the authority for charges often in excess of those previously scheduled, which resulted in the further Act of 1894, are historical phases which must be passed over to come to the Railways Act of 1921. This Act provided for a new and enlarged classification with standard charges based thereon, and the establishment of the Railway Rates Tribunal with, *inter alia*, powers of approval or revision in the matter of exceptional rates below 40 per cent. of the standard charges.

Functions of the Railway Rates Tribunal

This body can pass judgment upon the formation of such proposals by the railways, who have already conducted negotiations with the traders and have been satisfied that such reductions as are recommended are justifiable, the function of the Rates Tribunal being two-

CHIEF GOODS MANAGER'S OFFICE
RATES DEPARTMENT ORGANISATION



fold in that they are adjudicating upon the merits of such applications both from the trading point of view, and the protective measures they are entitled to take should they consider reduced charges proposed by the railway ill-advised on the score of its annual revenue earnings, fixed at a given sum and unfortunately never so far attained.

The standard charges and exceptional rates, together with the conduct of the railway by its management, come under review by the Tribunal annually unless the Minister of Transport directs otherwise. There is something to be said for the fact that the railways as a whole have never so far failed to obtain a certificate of competence after a very extensive review of their activities for each preceding 12 months.

Agreed Charges

The Road and Rail Traffic Act, Part II, became operative as from January 1, 1934, in section 37 of which some relief is given from the undue preference clauses of the Acts of 1854 and 1888, by which the railways were obliged to weigh meticulously the giving of a rate for a certain commodity however separate and peculiar might be the circumstances for this one particular purpose, because it might find itself before the Courts upon a charge of conferring undue preference upon one trader as against another engaged in the same business in the same or a different part of the country.

This relief has exclusive regard to a new phase of railway charging known as the "Agreed Charge," which railways are now authorised to make by and with the consent

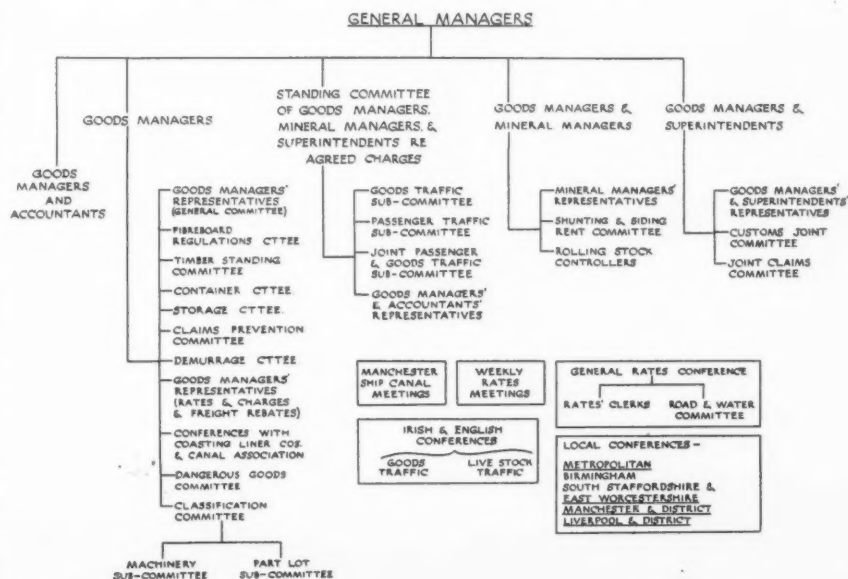
with competing transport to go forward with this new invention and try out its full potentialities. Briefly described, the charging by distance and fixed quantum of rate goes by the board, as does the classification in larger degree, the trader contributing in his submission the full and complete subject matter of his present employment of transport whether by rail, road or sea, or all three, and the summation of his total costs by comparison with rail charges is the basis upon which a negotiable figure can be produced, agreed, and the contract sealed, an endeavour being made to obtain an understanding that the whole of his traffic is handed to the railway company for conveyance. Lastly and by no

of the trader for the conveyance of his traffic at a fixed figure per unit, generally per ton.

Recent history having a direct bearing upon this legislation relates to an offer experimentally of an area rate for a specific quantity of traffic, which giving an average rate per ton enabled the firm to calculate that its existing transport by rail and road was more expensive than the offer of the railway company; and quite hopefully the experiment was tried. Opposition arose from traders of the same denomination, the law, acting through the agency of the Railway Rates Tribunal and the Appeal Court, discovered itself to be outraged, and the Great Western Company were sentenced as defaulters.

The Road and Rail Traffic Act has now made what was illegal legal. The railways have been strengthened in their fight

INTER-COMPANY ORGANISATION FOR AGREEMENT ON COMMERCIAL POLICY, INCLUDING RATES & CHARGES

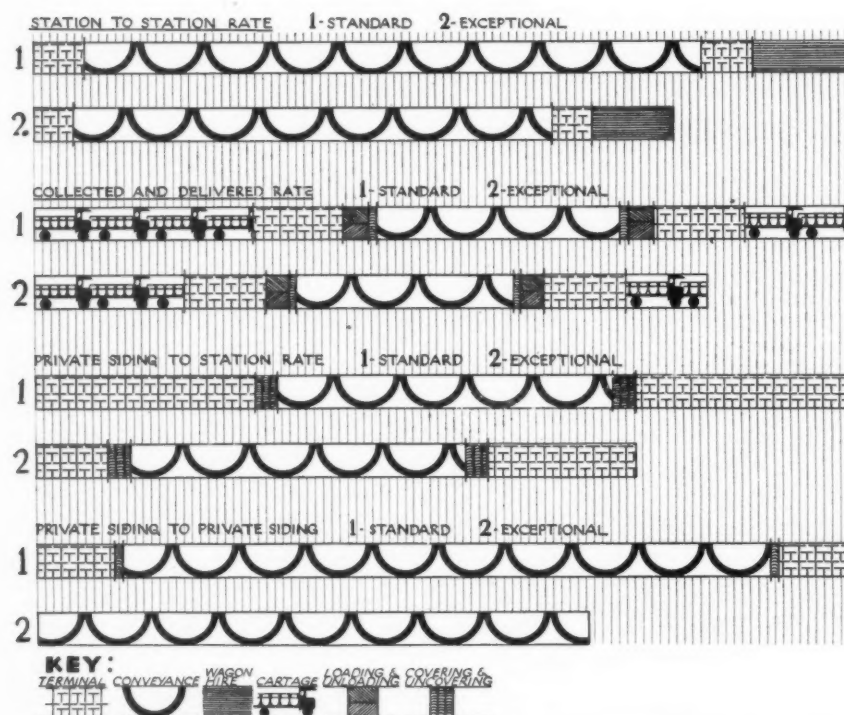


means least, comes the requirement that the Railway Rates Tribunal shall approve such an Agreed Charge, and they will require to be satisfied that the accommodation sought by the trader cannot be provided by exceptional rates. If another trader prove prejudice to his business, he has a right to an Agreed Charge if the Tribunal thinks so.

Competition

On the subject of competition, which also falls into its appropriate place under other headings of these notes, it will be sufficient to say that the Rates Section of the Department has collated masses of information as to traffic and charges by rival transport for comparison. It has the daily reminders from traders that they have another string to their bow in the way of alternatives. It has, above all, the desire to make reasonable concessions where such are possible, with a datum line below which railway charges can be unremunerative and the salutary effect of the knowledge that large reductions require justification before the Tribunal.

DIAGRAMMATIC EXAMPLES OF RATE
DISINTEGRATION



Another problem is the demand for reduced rates on the part of competing traders who are not geographically so favourably situated as are others for a particular market. Fundamentally a railway company cannot equate the disadvantages of location. One of the principles governing the quotation of exceptional rates is founded upon large quantity forwardings. The arithmetic of more tons for a smaller charge per ton which will attract the traffic is sound. Here the basic trades are assisted. Iron and steel and its raw materials, building and road making materials, agricultural products and requisites, receive the greatest consideration, and are encouraged to develop on low transit costs, which have their due effect upon the ultimate price of the finished goods.

Principles of Rate Making

There are no clearly defined lines or bases on which modern rates making can be explained. It is the general practice to deal with each case on its merits, the quantum of each rate being fixed having regard to—

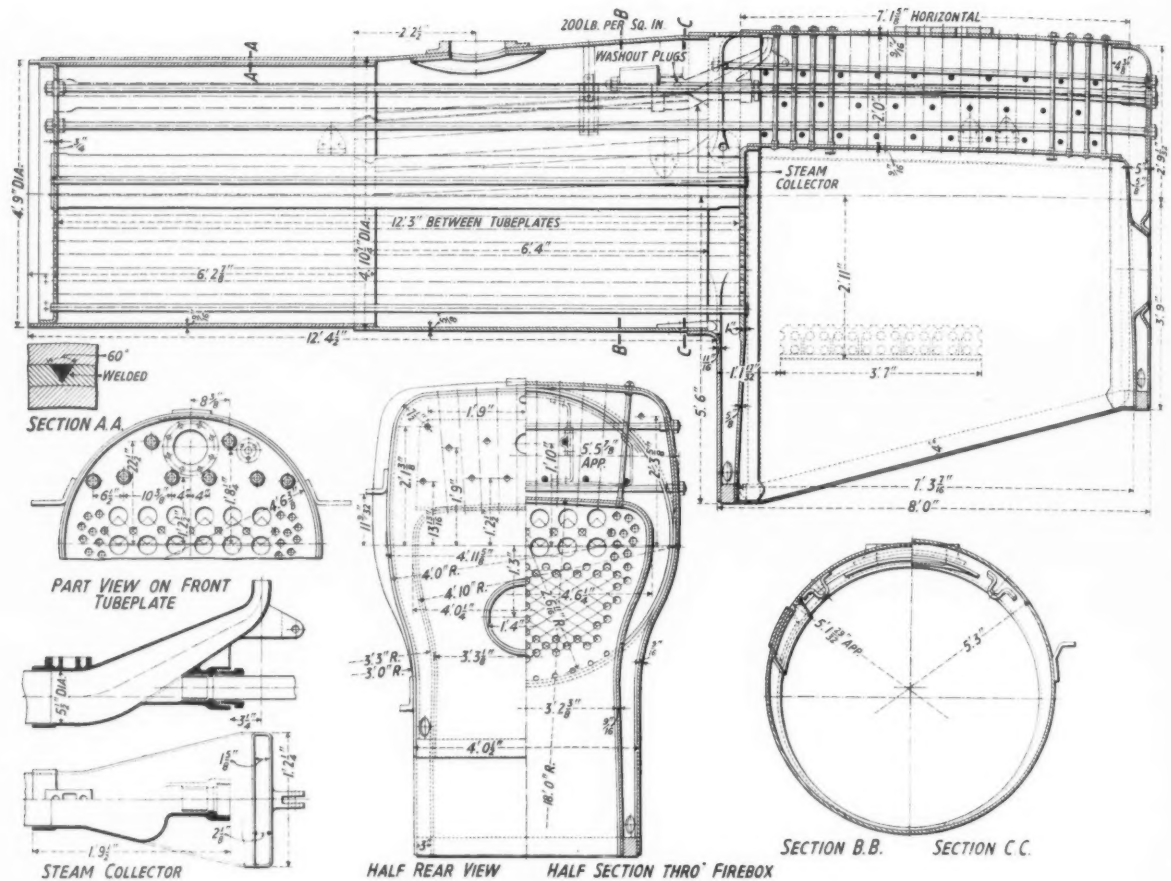
- (1) Its effect on the revenue on present carryings of the specified traffic, new tonnage or other unit of quantity to pass, loading capacity and yield per ton mile of rate.
- (2) Its relation to the rates on similar traffic in the same or other classes.
- (3) The holding of the balance between applicants and their competitors so that preferential treatment cannot be alleged.
- (4) The minimum tonnage or other unit of quantity passing within a period.
- (5) The other means of transit available, e.g., road or water or both.
- (6) In the case of imported traffic the maintenance of the balance from the various ports to inland stations or other ports.
- (7) In the case of London traffic over comparatively short distances, the heavy out-payments for cross-London tolls affecting the yield to the Great Western Company.
- (8) Other special circumstances as they arise.

The tonnage unit of quantity would not apply to live stock traffic.

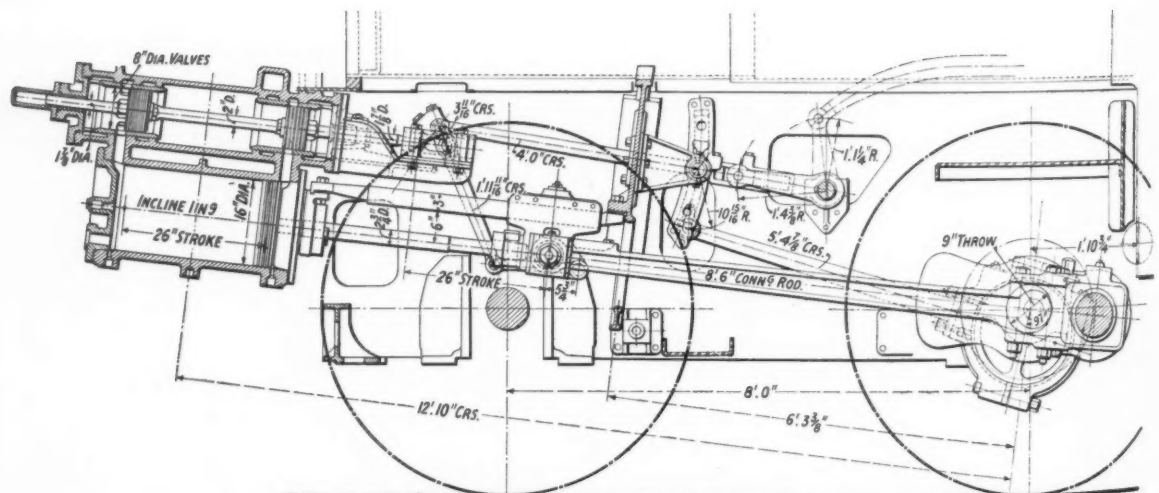
(To be continued)

WELDING OF STEEL STRUCTURES.—B.S. Specification No. 538 for Metal Arc Welding of Steel Structures has just been issued and deals with quality of material, method of making welded joints, permissible working stresses, workmanship, mechanical tests on welded joints and supervision. A complete specification for appropriate covered electrodes is given in one appendix. Two further appendices deal with methods of making all-weld metal test pieces and the method of testing welded joints respectively and a fourth appendix is devoted to recommendations on the design of welded structures. The committee responsible for the preparation of this specification has realised the progress that is being made and is fully appreciative of the developments that are taking place. The specification is therefore prefaced with a note emphasising that the requirements must be regarded as being tentative only. It is also intimated that the intention is to review the specification at an early date in order that its requirements may be brought up to date. The present recommendations are of a somewhat elementary character but it is anticipated that as experience is obtained they will be amplified and made more comprehensive so that the usefulness of the specification may be extended. As it stands, however, it will be of considerable assistance to those interested in this increasingly popular method of construction, as it establishes a good standard of work which should secure the confidence of all concerned. Copies of this specification may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 2d. post free.

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Boiler and firebox details



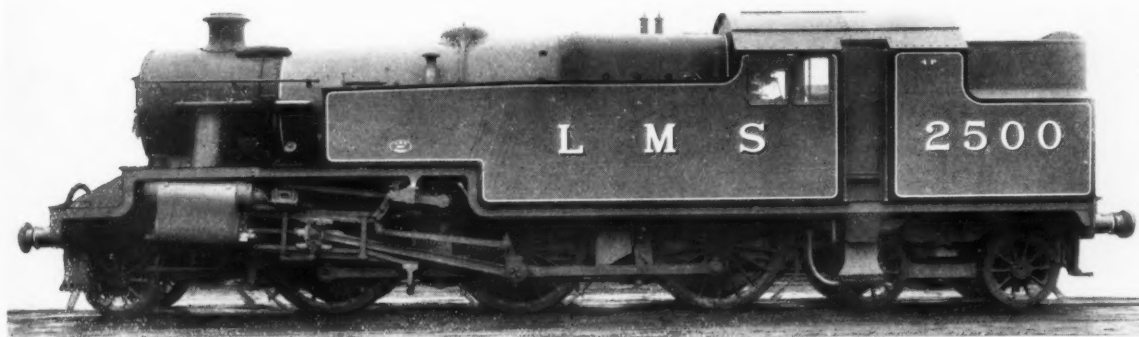
Arrangement of inside cylinder, piston valve, and Walschaerts valve motion

THE NEW L.M.S.R. 2-6-4 PASSENGER TANK LOCOMOTIVES

(See article on opposite page)

NEW THREE-CYLINDER 2-6-4 PASSENGER TANK ENGINES, L.M.S.R.

Thirty-seven of these locomotives are being built at the company's works at Derby to the designs of Mr. W. A. Stanier, Chief Mechanical Engineer

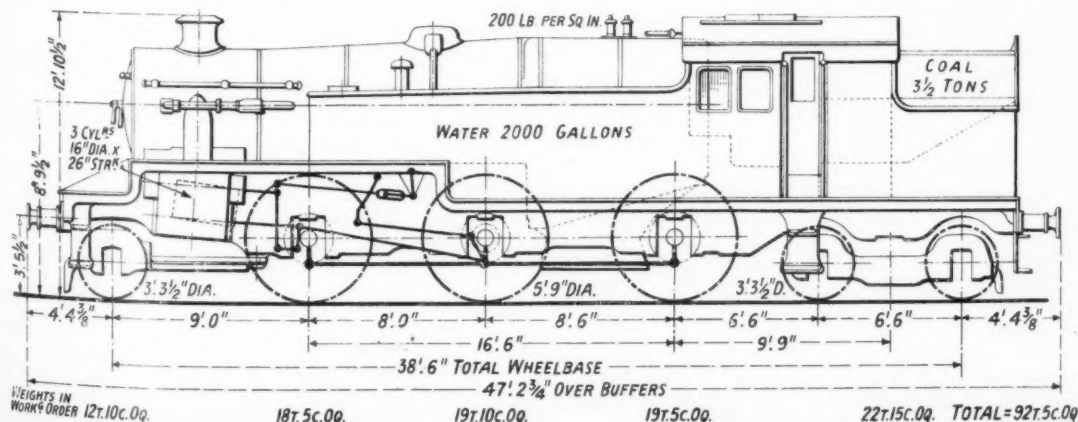
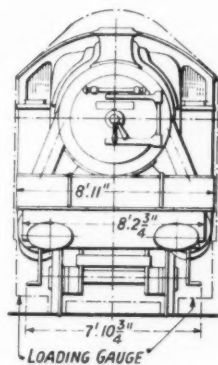


THE new L.M.S.R. three-cylinder tank engines now being built at the company's works at Derby to the number of 37 have the same wheel arrangement as that of the existing standard 2-6-4 two-cylinder class, of which 125 are in service, the numbers ranging from 2,300 to 2,424 inclusive. The new series, however, provides a greater output of power and the three-cylinder arrangement has been adopted as a means of ensuring high acceleration for working fast suburban traffic. Some of the engines will be used on the Tilbury and Southend Section, where these qualities will be especially useful.

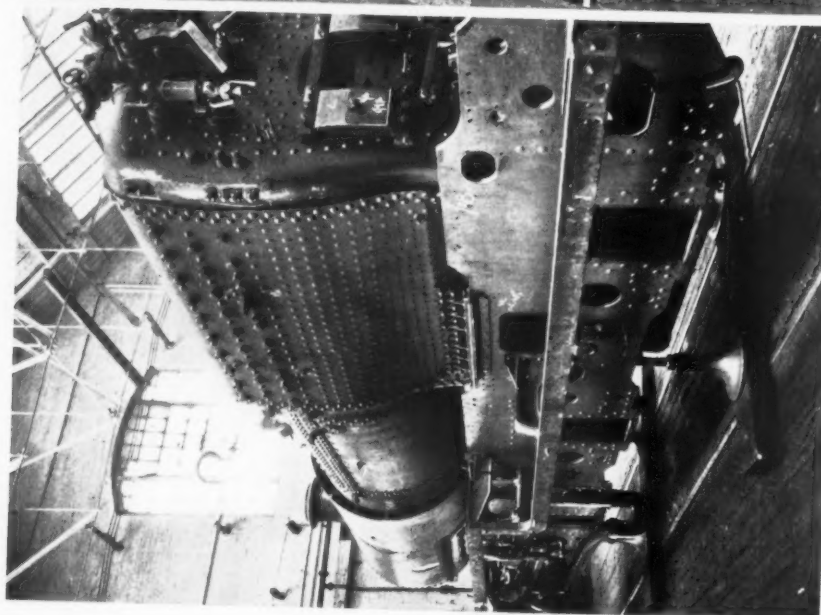
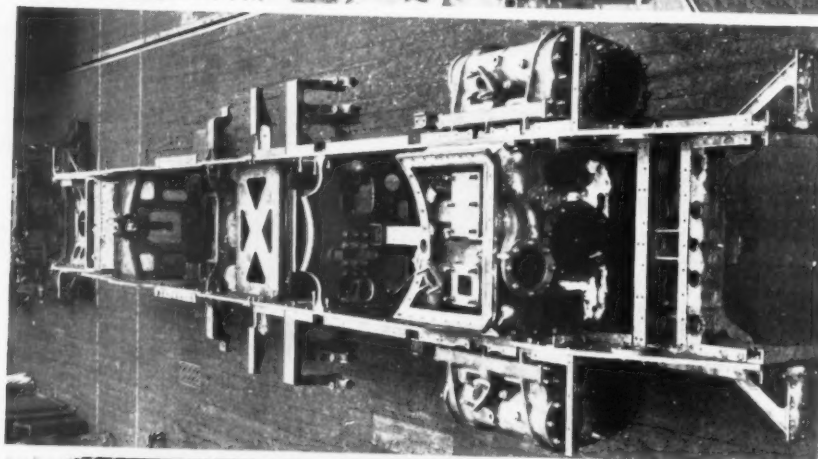
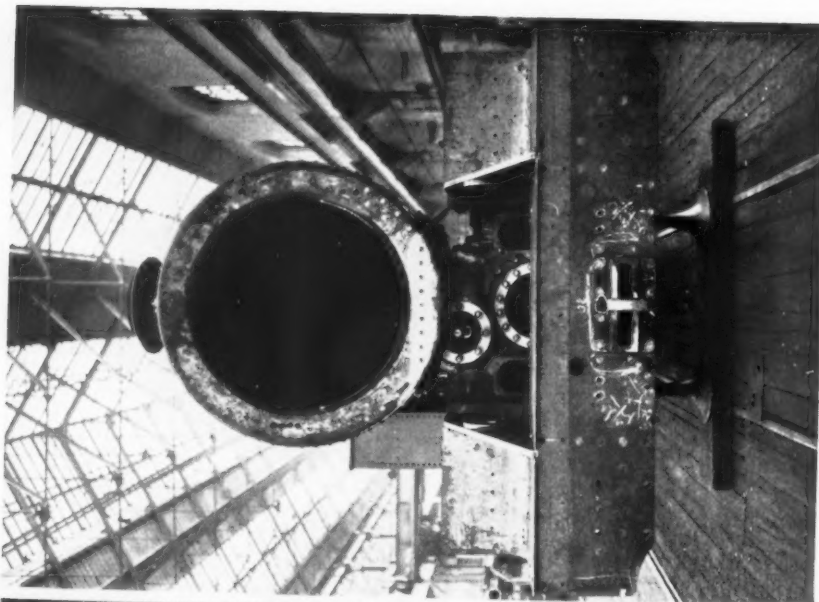
The three cylinders are inclined and drive the second pair of coupled wheels; double slide bars are used for the outside cylinders, and a single slide bar for the inside motion, the latter being necessary in order to accommodate the Walschaerts gear and to clear the leading straight axle. The outside piston valve steam chests are placed above the cylinders, and that of the inside cylinder is off-set and occupies the position seen in two of the illustrations on page 548, which show the engine in the Derby works during construction. The coupling and connecting rods and motion details are, in accordance with the latest practice, made of high tensile manganese-

molybdenum steel. The connecting rods are of fluted section, and that of the coupling rods rectangular. The piston valves, cylinders and piston rod packings are provided with mechanical lubrication, each piston valve head being fitted with a steam atomiser, the control valve for which is mounted under a cover near the top of the smokebox on the left-hand side. The valve spindle bushes are also mechanically lubricated. The mechanical lubricators are of the railway company's standard type.

The wheel centres take the form of steel castings with the wheel rim of triangular section, and the tyre fixing is of the Gibson retaining ring type. The balance weights for the coupled wheels are built up of steel plates on both sides of the spokes and riveted, the requisite weight being provided by filling in between the plates with lead. For the coupled wheels cast steel axleboxes are used, having pressed-in



Diagrams of front end and side elevation



Some of the new locomotives in course of erection at Derby works

brasses with a white metal crown and oil grooves on both sides of the crown to ensure a thorough distribution of oil to the journal. The axlebox underkeep carries an efficient oil pad. The leading and trailing axleboxes are arranged so that the oil pads can be examined by sliding out the underkeep while the axlebox is in position. This arrangement cannot, however, be provided on the middle coupled axlebox on account of the crank axle and eccentric. Each of the axleboxes is provided with a dust shield carried on the inside face of the box. A separate mechanical lubricator supplies the coupled axleboxes, each of which has an independent oil feed to the crown of the box, with a standard back pressure valve and flexible oilpipe connection.

All the laminated bearing springs for the engine are made of silico manganese steel, the plates being of ribbed section and having the cotter type fixing in the buckle. The spring links are of the screwed adjustable type.

The two-wheeled leading truck with its anchor pin is attached to a cross stretcher between the main frames at a distance of 6 ft. 7 $\frac{3}{4}$ in. behind the truck wheel centre. The weight on the truck is taken through side bolsters, and the bogie side check spring gear has been carefully arranged to ensure smooth riding. The four-wheeled bogie at the other end is of the company's standard type, the weight being taken through side bolsters, while the bogie side check spring gear is very flexible and ensures smooth riding.

The boiler barrel is tapered and has an outside diameter of 4 ft. 9 in. at the front end, increasing to 5 ft. 3 in. where it joins the firebox. The latter is of the Belpaire type and has mounted upon it two Ross pattern pop safety valves 2 $\frac{1}{2}$ in. diameter, which blow off at the boiler pressure of 200 lb. per sq. in. A standard type of sliding fire

door is provided and a screen is used to prevent glare from the fire. The boiler is fed by a Davies & Metcalfe exhaust steam injector with 9 m/m cones fitted on the fireman's, i.e., the right-hand, side, and a Gresham & Craven live steam injector with 10 m/m cones mounted on the left-hand side. Other boiler mountings, such as a water gauge, frames and protectors, &c., are of the railway company's standard type. The regulator is in the smokebox.

The controls for the steam supply are conveniently placed on a steam manifold having a main shut-off valve located on the top of the firebox door plate in the cab. This carries the necessary valves for the ejector and steam brake, injectors, carriage warming, whistle, pressure gauge and sight feed lubricator to the regulator. The boiler feed water is supplied through top feed valves fitted on the second boiler ring and having water distributing trays. The cab is completely enclosed and, as we are able to testify from inspection at the Derby works, very conveniently arranged, roomy, with good ventilation, and a clear lookout in both directions. The width over the cab and side tanks is 8 ft. 10½ in. The drive is on the left-hand side, and all controls are arranged for convenient handling. Tip-up seats are fitted on each side of the cab, and there are also two sliding windows on each side with hinged windows on the front and back plates of the cab. A new feature is that the coal bunker is narrowed at the top so that a clear lookout is provided when the engine is running bunker first.

The steam brake is fitted to the coupled wheels of the engine, and is controlled by the driver's vacuum brake valve. A vacuum pump is carried on the inside of the motion plate and is driven from a connection from the inside crosshead. When the engine is standing, the small

ejector maintains the vacuum on the engine and train. The fitting seen in the photograph at about the centre line of the boiler and alongside the smokebox comprises the ejector for the vacuum brake apparatus. A hand brake is also used. The sanding arrangements are of the mechanical trickle type, the sand being delivered in front of the leading wheels and at the front and back of the middle (driving) pair of coupled wheels. In addition to this a water de-sanding apparatus is provided which automatically comes into action, so that after the engine has used the sand in the fore or reverse direction, as the case may be, the rails are cleaned with hot water to prevent interference with the track circuits.

The following are the main particulars:—

Cylinders (3)—diameter	.. .. .	16 in.
stroke	.. .. .	26 in.
Wheels, coupled	.. .. .	5 ft. 9 in.
Wheelbase, coupled	.. .. .	16 ft. 6 in.
Wheelbase, total engine	.. .. .	38 ft. 6 in.
Boiler working pressure	.. .. .	200 lb. per sq. in.
Heating surface, tubes	.. .. .	1,011 sq. ft.
firebox	.. .. .	137 sq. ft.
Total	.. .. .	1,148 sq. ft.
superheater	.. .. .	160 sq. ft.
Combined total	.. .. .	1,308 sq. ft.
Grate area	.. .. .	25 sq. ft.
Weight of engine in working order	.. .. .	92 tons 5 cwt.
Water capacity of tank	.. .. .	2,000 gallons.
Coal capacity of bunker	.. .. .	3½ tons.

The engine exerts a tractive effort, at 85 per cent. of the boiler pressure, of 24,600 lb. The series will be numbered 2500 to 2536 inclusive. We comment on the design of these locomotives on page 533.



The new branch now under construction in Western Norway from Voss, on the main Bergen line, to Eide, Norwegian State Railways

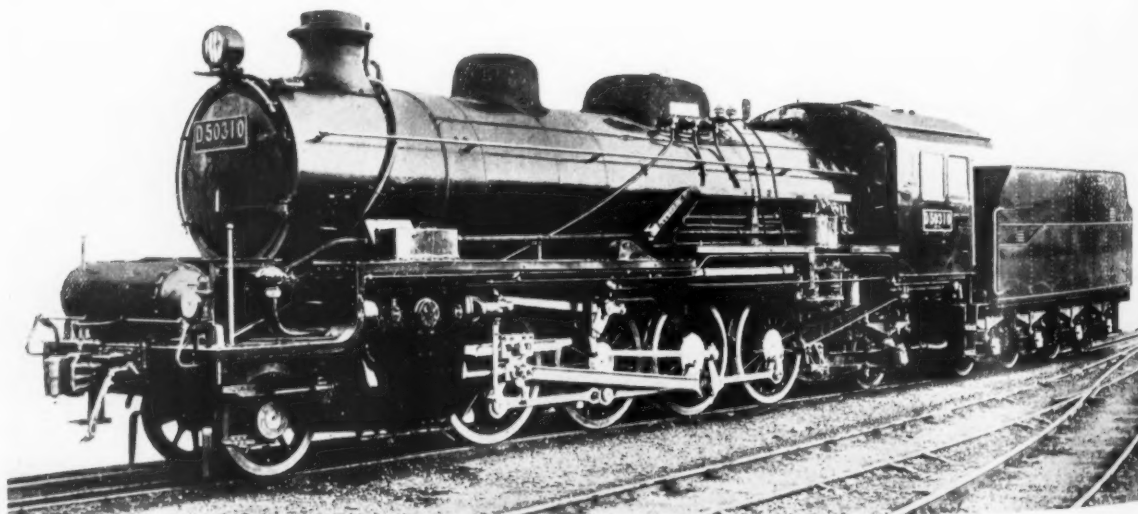


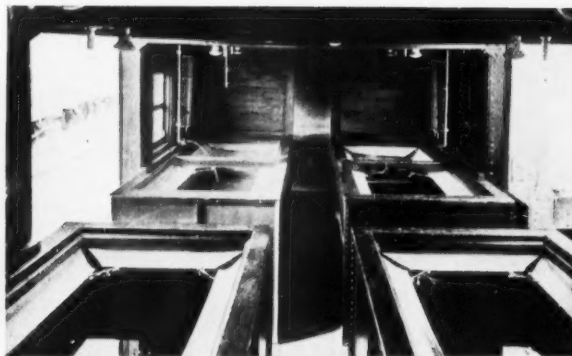
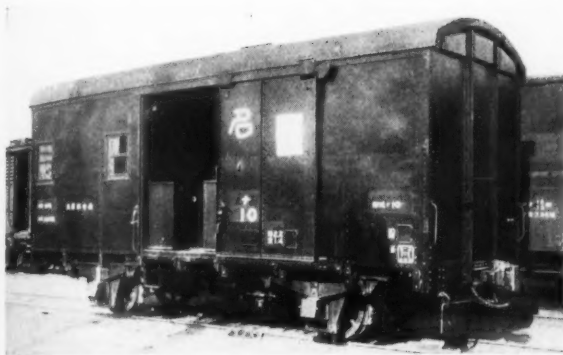
Above—Tokio main station as re-built after the great earthquake, 1924



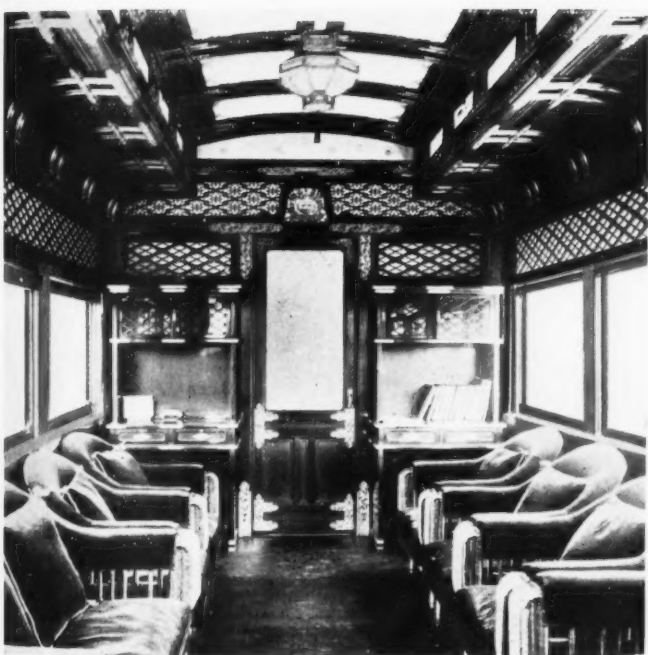
Right—The Swallow Limited express from Tokio to Kobe, running in the Tokio electrified area

Below—A recent two-cylinder Mikado heavy goods locomotive





Above: Exterior and interior of a live-fish van used for long hauls on express schedules

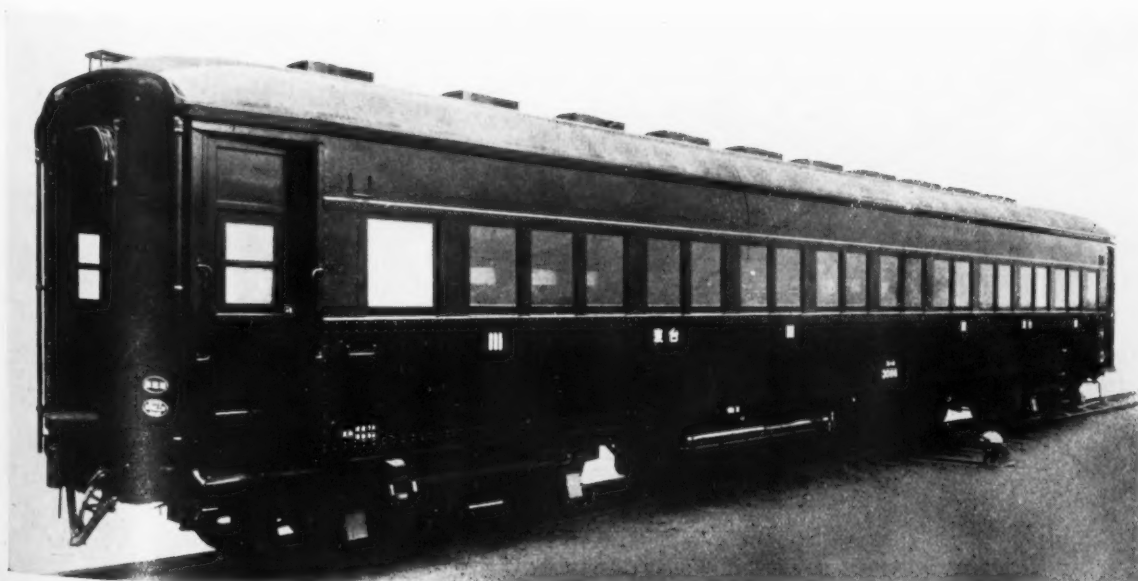


Left: Interior of first class observation car used on the Tokaido route

RECENT ACTIVITIES ON THE JAPANESE GOVERNMENT RAILWAYS

(See article on page 541)

Below: An all-steel convertible third class sleeping car with 52 berths. A number of these vehicles is in use on the night trains between Tokyo, Kobe, and Shimonoseki





Paddington goods station, Great Western Railway (See article on page 542)

RAILWAY NEWS SECTION

PERSONAL

Monsieur J. B. Verlot, who, as announced in *THE RAILWAY GAZETTE* of March 16, has been appointed an Assistant to the General Traffic Manager, P.-O. & Midi Railways, entered the Paris-Orleans Railway as "Ingenieur Agronome" in 1921,



Monsieur J. B. Verlot.

Appointed an Assistant to the General Traffic Manager, P.-O. & Midi Railways, France

specialising in the branch for the conveyance of produce and perishable traffic. Two years later he was appointed Correspondant of the P.-O. & Midi Railways in London with the object of developing the produce traffic from the Midi and P.-O. areas of France to Great Britain. In addition, the appointment covered the development of Spanish traffic via France and the promotion of English tourist traffic to districts in France served by the two railways in question—notably the Loire, Pyrenees, Auvergne, Andorre—and to Spain. For the past two years he has been a member of the Committee of the French Chamber of Commerce in London. Monsieur Verlot has now been appointed one of the Assistants to the General Traffic Manager for the Development of Traffic, with headquarters in Paris in the offices of the amalgamated P.-O. and Midi Railways.

Mr. Rolt Hammond, A.M.I.C.E., has been appointed Assistant Secretary to the Institute of Fuel.

On March 21, a luncheon was given by the British Chamber of Commerce in Buenos Aires, in honour of Sir Follett Holt, the recently appointed Chairman

of the B.A.G.S. Railway Company, Sir Herbert Gibson, Chairman of the Local Board, presiding.

Captain C. D. Neroutsos, Manager of the Canadian Pacific British Columbia coast steamship service, is retiring in April, after 33 years' service, 17 of them as Marine Superintendent and 6 as Manager. He will be succeeded by Capt. R. W. McMurray, now Marine Superintendent.

Dr. Angel Gallardo, a Local Director, has been appointed to succeed the late Dr. Montes de Oca as Chairman of the Local Board of the Buenos Aires & Pacific Railway. A brief biographical paragraph and photograph of Dr. Gallardo were published in *THE RAILWAY GAZETTE* of December 1, 1933.

INDIAN RAILWAY STAFF CHANGES

Mr. W. H. Burnand has been confirmed as Chief Operating Superintendent, E.I.R.

Mr. E. H. Keelan, Deputy Chief Operating Superintendent, N.W.R., has been granted 28 months' leave preparatory to retirement as from June 1 next.

Mr. E. G. Rodwell, Deputy Chief Engineer, E.I.R., has been granted leave for 28 months, prior to retirement, as from February 28.

Questions in Parliament

Canton-Hankow Railway

Mr. Rankin asked the Secretary of State for Foreign Affairs, on March 19, whether it would be a condition of the approval of the £1,500,000 loan by the British Boxer indemnity fund for the purpose of completing the railway between Canton and Hankow, that all railway material required to be imported therefor should, so far as possible, be of British manufacture.

Sir J. Simon.—I understand that the Board of Trustees have under consideration a proposal to raise a loan secured on the half of the British share of the Boxer indemnity instalments paid to the Board in accordance with the terms of the China Indemnity (Application) Act, 1931. The proceeds of the loan would be expended on construction work in connection with the Canton-Hankow Railway in China and not on foreign material, but the carrying out of this work would subsequently result in large orders for railway material and equipment being placed in this country by the Chinese Government Purchasing Commission in London. My right hon. friend the Chancellor of the Exchequer, has decided to offer no objection to the proposed sterling loan to be raised in Shanghai.

Signalling improvements in Holland

The signalling department of the Netherlands Railways, under the direction of Mr. G. J. de Vos van Nederveen Cappel, Hon.M.Inst.R.S.E., has been kept busy during the last twelve months. A considerable number of mechanical signalling installations have been enlarged and improved and the fitting of modern junction signalling, with three-indication distant signals, has been pushed forward, several additional stations having now been equipped. At Alphen-on-Rhine and Schaesberg all-electric power signalling of the most recent type has been adopted. Another improvement that is being rapidly extended is the use of additional distant signals to repeat the starting signals at stations where through trains run, the ordinary distant signal applying only to the home signal, as is customary abroad. The change from the white to the green light for "proceed," although decided on in principle, has not yet been carried out, as many preliminary arrangements have to be made before it can be undertaken.

On several important sections the normally free lock-and-block, as used originally by the Holland Railway Company, has been converted to the State Railways normally locked form, now considered the standard for the unified undertakings. This pattern of apparatus has also been extended to some lines hitherto worked by telegraph and bell only. A number of automatic block signalling sections are also to be seen. The safety record of the Dutch railways is excellent and is largely due to the simple but well-planned and efficient signal system.

MINISTRY OF TRANSPORT REPORT ON LIGHT RAILWAYS.—The report of the proceedings of the Ministry of Transport under the Light Railways Acts, 1896 and 1912, and the Railways Act, 1921, up to December 31, 1933, has been published. On December 31, 1932, two applications were under consideration, in respect of one of which (the Wincham) an Order has recently been issued. The Wincham Light Railway, promoted by the New Cheshire Salt Works Limited, is of the N. class, 5 chains in length on the 4 ft. 8½ in. gauge, and is intended to connect the promoters' works with the railways of the Cheshire Lines Committee, the estimated cost of construction being £1,129. The Local Government Act, 1933, passed on November 17 last, will enable the financial provisions inserted in future light railway orders promoted by local authorities in England to be simplified.

BRIDGE DEMOLITION ON THE ROMFORD-SHENFIELD WIDENING, L.N.E.R.



Bridge No. 109, near Harold Wood, demolished with explosives, was first cleared of its roadway, parapets, &c., as in the first illustration, and the charge was then fired. The exploding mass of brickwork is shown in the centre picture and the debris resulting was being cleared when the third photograph was taken

American Accelerations

Some remarkable figures appeared recently in our American contemporary, the *Railway Age*, showing the extent to which acceleration has been carried out over long-distance routes in the United States and Canada during the past five years. Figures concerning some of the principal routes affected are given in the annexed table. Most

traversed—through the heart of the mountain ranges on the western seaboard—is the average speed of all but 40 m.p.h. maintained over the 2,228 miles from Chicago to Los Angeles, with a large number of intermediate stops. But this speed will, of course, be completely eclipsed on the introduction by the Union Pacific Railroad

LONG-DISTANCE AMERICAN ACCELERATIONS, 1929-34

Service	Distance miles	Fastest Time		Acceleration 1929/1934		Overall Speed 1934 m.p.h.
		1929 hr. min.	1934 hr. min.	Per cent.	m.p.h.	
New York-Washington ...	227	4 40	4 15	0 25	9	53.4
New York-Boston ...	229	5 10	4 45	0 25	8	48.2
New York-Montreal ...	384	10 00	9 35	0 25	4	40.1
New York-Pittsburgh ...	440	9 18	8 59	0 19	3	49.0
New York-Chicago ...	961	20 00	17 45	2 15	11	54.1
New York-Miami ...	1,386	35 45	28 00	7 45	22	49.5
Chicago-Montreal ...	848	22 25	18 10	4 15	19	46.7
Chicago-Seattle ...	2,190	68 00	59 15	8 45	13	37.0
Chicago-Los Angeles ...	2,228	63 00	56 00	7 00	11	39.8
Chicago-San Francisco ...	2,258	63 00	60 55	2 05	3	37.1
Toronto-Montreal ...	334	7 40	6 30	1 10	15	51.4
St. Louis-Cincinnati ...	339	8 30	7 30	1 00	12	45.2
Cincinnati-Richmond ...	580	17 10	14 24	2 46	16	40.3
Washington-Detroit ...	684	17 50	16 15	1 35	9	42.1

notable among them, probably, is the cut of $7\frac{1}{4}$ hr. in the best time from New York to Miami, the popular winter resort on the Florida coast, equivalent to a gain of 22 per cent., and following on some substantial accelerations of this service in the years immediately preceding; not only so, but the average speed of 49.5 m.p.h. over this journey of 1,386 miles is maintained inclusive of all intermediate stops, and over a route which is largely single-track. Not much less notable, in view of the character of the country

of the streamlined train illustrated and described in THE RAILWAY GAZETTE of June 16, 1933, when it is hoped to cut the time from Chicago to San Francisco by fully 24 hr., bringing the journey down to about 37 hr., and the overall average speed up to 61 m.p.h., again through the Rockies and inclusive of all stops. In Canada the Toronto-Montreal time shows a reduction of 15 per cent. in five years; but a much bigger cut was effective during the period of the strongest competition between the Canadian National and

Canadian Pacific Railroads, for the best time over the Canadian National 334-mile route was then 6 hr., and the reduction on the 1929 time was 22 per cent. With the Montreal-Toronto times, those between Montreal and Chicago have benefited considerably; but not so those between Montreal and New York, which have been hampered by some lethargy in the matter of acceleration on the part of the railways of the New England States. This is also reflected in the moderate speed achieved between New York and Boston, as compared, say, with New York-Washington or New York-Chicago.

Stress is laid by the *Railway Age* on the fact that these improvements have been brought about at a time of unexampled depression, during which the revenue per passenger-mile has dropped from 2.97 to 2.04 cents—that is, a reduction to the passenger of over 31 per cent. Combined with higher speeds and lower rates, a great increase has taken place in the proportion of air-conditioned stock, with a commensurate increase in the comfort and cleanliness of the trains. It is claimed, indeed, that “travelling by train has become one of the greatest bargains which American industry is offering to the public,” and, just as in Great Britain, the downward tendency in railway passenger travel was arrested just before midsummer of last year; every month since May, 1933, has shown an increase in the American passenger returns. It is expected that this tendency will become more pronounced as soon as the American public becomes better acquainted with the improvements in the celerity, comfort, and cost of travel which have been made on so extensive a scale by American railroads during the past few years.

(See editorial note on page 532)

Welded Structures in Germany

In a recent lecture before the Institution of Structural Engineers entitled “The Technical and Economic Execution of Welded Steel Structures and their Reliability,” Dr. Ing. E. H. Hans Schmuckler presented an instructive survey of the trend of welding technique in Germany, Czechoslovakia and Poland. Permissible working stresses have been raised. Plate girder designs for railway bridges up to 115 feet span have been carried out without hesitation, though there has been rather less confidence in truss designs.

The lecturer pointed out that it is a mistake to suppose that a welded design is in every case cheaper than a riveted one, and also that it calls for the same insistence upon good materials and trained personnel. The main advantage of welded as compared with riveted construction is a saving of from 10 to 25 per cent. in weight, and it becomes therefore of enhanced

importance for designs in which a decrease in dead weight is aimed at. The calculation of welded designs is simpler than for riveting, as is also their preparation and assembly. Figures were given for the approximate allocation of costs.

Dr. Schmuckler mentioned two notable departures from riveted practice, namely, the discontinuance of the use of bracing of angle-section, which has no place in the newer welded designs, and the growing confidence in butt welded joints. The last named is an ideal which ensures mechanical continuity of the beam and eliminates the use of cover plates, which have been found inefficient. Transverse joint-plates or stiffeners are also employed instead of straps in the web joints of plate girders. Arc is preferred to gas-welding, and bare electrodes to covered. Certain rolled sections developed to exploit peculiarities

of welding technique were described, notably the divided I-section beam which is slit into two T's by torch-cutting or by rolling the top and bottom halves apart (Peiner process).

The lecturer discussed methods of inspection and testing, and stated there had not yet been a single case of an accident or failure in a welded structure.

FRENCH RAILWAY BOND ISSUE.—Announcement is made of a 6 per cent. 15-year bond issue which is being made jointly by the Est, Midi, P.L.M., Paris-Orleans, Alsace-Lorraine, and State Railways, at the price of 94.2 per cent. These bonds are redeemable at par by half-yearly drawings, the first of which will take place on September 15 next. The service of the bonds is a charge on the profits of each borrowing railway, and on the Common Fund should the profits not be sufficient. Failing both, the French Treasury has to make good the deficiency.

A Passenger's Criticisms of British Railways

A very interesting meeting was held at Paddington station on March 22, under the auspices of the G.W.R. (London) Debating Society, when Mr. G. N. Mount gave a paper on "A Passenger's Criticisms of British Railways." Mr. J. A. Kay, Editor of THE RAILWAY GAZETTE, presided over a crowded attendance of members.

In opening the proceedings, Mr. Kay explained that the meeting had arisen out of a letter written by Mr. Mount and published in THE RAILWAY GAZETTE of January 12. The letter contained criticisms of British railways and set forth certain suggestions which, in the writer's view, would help to popularise railway travel. The author sent a copy of his letter to the Chairman of the Great Western Railway (Sir Robert Horne) with a further elaboration of his views, and following upon this he was invited to state his opinions in detail before the Debating Society. Mr. Mount began by expressing appreciation of the courtesy of the Great Western Railway Chairman in making it possible for him to outline his views before the society. He explained that he did not speak as an amateur student of railways, but as an ordinary passenger who had travelled a good deal in different parts of the world; he had no sort of bias against railways as such; and his remarks would apply to British railways generally and certainly not to the Great Western in particular.

Unpunctual Trains

The speaker alleged that one of the most unsatisfactory features of British railway operation was unpunctuality, and suggested that technical difficulties were not its sole cause, attributing it in part to human shortcomings, *e.g.*, slackness and defective organisation. He further said that whatever its cause it was something that should be put right at any cost as being a source of great inconvenience and annoyance to passengers. On the subject of unnecessarily slow trains he instanced the service to a town 43 miles from London (not on the Great Western Railway) on a main line, for which the 25 daily trains averaged 86 minutes to accomplish the journey. He suggested that too many trains were being run on this specific service and that many of them were far too slow. The speaker also said that certain trains were frequently overcrowded, and that not infrequently the same train was allowed to suffer in this way time after time before any action was taken.

In regard to heating of trains much was needed to be done. He suggested specifically that each compartment should contain a thermometer, and that heat should be maintained between agreed limits by a rule to be rigidly enforced. Train heating, in his view, was done better and more systematic-

ally abroad than in this country. On the subject of train cleanliness, he suggested that cleaning was too often of a very perfunctory order and that a higher standard should be maintained. The speaker thought that railway waiting rooms were unnecessarily dreary and uninviting, and usually also uncomfortably cold. He suggested the installation of a noiseless self-closing door spring—and a thermometer. He was uncomplimentary about "the railway sandwich," also the quality of tea and coffee served in refreshment rooms, and further said that station restaurants should be improved and modernised on the model of the best Continental style. He also pleaded for modern and conveniently placed train arrival indicators and particularly did not like the position or mode of operation of the indicator that used to be in an exposed position at Paddington.

Carriages and Catering

Mr. Mount favoured the centre-corridor type of carriage, equipped with seats having high reversible backs. In the matter of railway publicity he thought too much emphasis was placed on railway speeds, which were not spectacular in these days of aeroplanes, motors, &c., and too little on safety, punctuality, comfort and restfulness. He had something to say on esprit de corps and methods of stimulating the staff to give their best service.

Mr. Mount's final subject was the restaurant car service. He thought that more attention generally should be paid not only to actual cleanliness but to the atmosphere of cleanliness. The interior of the cars should be an aesthetic delight, with warmth, light, brightness, freshness, and spotless cleanliness the characteristics. He thought that leather upholstery was more suitable than cloth for restaurant cars; that the quality, freshness and variety of food served might be better than at present; that the waiters should wear white jackets, changed daily, and that the tone of the whole service should be considerably keyed up.

In the subsequent debate Mr. Mount's challenges were taken up, and attention was drawn to the noteworthy fact that nearly all the specific illustrations given were from other railway companies' services. The difficulty of maintaining unflinching punctuality was stated to be largely due to permanent way works, such factors as weather and wind conditions, and the attaching and detaching of horse-boxes or other extra vehicles.

It was pointed out that the loading of trains was the subject of close supervision, and that every reasonable anticipation of traffic beyond the normal provided for. Several speakers pointed out the difficulty of meeting the wishes of individual passengers as to what was a desirable compartment temperature.

Six people in a compartment sometimes had six different ideas on the subject. There were, however, very definite and precise arrangements for regulating train heating with due regard to the prevailing weather.

The magnitude of the railway industry and its considerable age were stressed as explanations of much that had been criticised in waiting rooms, refreshment rooms, &c., but improvements were embarked upon where they were an economical possibility, and such improvements were invariably up to the best modern standards. If Mr. Mount came to Paddington in a few weeks' time he would be able to see a very fine electric indicator, also a superb example of a modern waiting room. Central corridor coaches have been tried on the Great Western Railway but the company was satisfied that the majority of its passengers preferred the separate-compartment side-corridor type.

On the subject of refreshment and restaurant car services it was pointed out that the continued presence of the traditional ham sandwich proved the passengers' undoubted partiality to it. Other snacks had been tried, but the sandwich simply would not be displaced. Cleanliness of restaurant cars and attendants was closely supervised and the purchasing of food was carefully done, also its preparation and cooking. Mr. Mount would be interested to know that the company had decided to introduce white jackets for restaurant car attendants next summer, at a considerable annual cost. In connection with Mr. Mount's comparison with American and Continental dining car services, a letter was read which had been received from a North American railway, praising the Great Western service and asking for further details of the organisation.

Mr. Mount briefly replied to the discussion, and the meeting, which was of a cordial character, closed with votes of thanks to the speaker and chairman.

AGREED CHARGES.—The Railway Rates Tribunal on Friday, March 23, approved 36 applications submitted to it under the Road and Rail Traffic Act for agreed charges between specified traders and the four group railways. The Court had considered these applications on February 27 and 28, and March 1, 2 and 6, when its decision was reserved. The Court also approved Application No. 44, which had been considered on March 22. Its decision has been reserved on Application No. 39—for approval of an agreed charge between F. W. Woolworth & Co. Ltd., the four amalgamated companies, the Mersey Railway and the Metropolitan Line of the London Passenger Transport Board. This was considered on March 15, 16, 20, and 21, and was a charge based on percentage of the trader's payments for purchases.

RAILWAY AND OTHER REPORTS

English Steel Corporation Limited.

—Trading for the year 1933 resulted in a profit of £176,474 (against a loss of £219,495 for 1932), and after meeting interest charges, &c., and providing £100,000 for depreciation, the net profit comes out at £13,550. This reduces the debit balance carried forward to £241,773. During the year the reconstruction of the more important departments of the Vickers works has continued and considerable expenditure has been incurred.

Vickers Limited.—Net trading profit for the year 1933 amounted to £816,362, an increase of £4,767 over the figure for 1932. Deducting £272,997 for income tax, debenture interest, sinking fund, directors' fees, &c., there remains a net profit of £543,364. Preference dividends absorb £418,190, leaving £125,174, which, with £222,022 brought in, gives a total of £347,196. Payment of the dividend of 4 per cent. (less tax) recommended on the ordinary shares will require £123,155, leaving £224,041 to be carried forward.

Vickers - Armstrongs Limited.

—The net trading profit for 1933 of this company, which is controlled by Vickers Limited, amounted to £491,952, compared with £425,652 in 1932. Income-tax, directors' fees, and depreciation absorb £303,539, leaving a balance of £188,413, out of which the dividend at the rate of 7 per cent. per annum, less tax, on the A preference shares for the seven months ended November 30, 1930, already declared, requires £186,807, leaving £1,605, to which is added £76,389 brought forward from December 31, 1932, making an amount of £77,995, which the directors propose to carry forward. In 1932 the A preference share dividend was paid for the six months to April 30, 1930.

West Yorkshire Road Car Co. Ltd.

—This company, which is jointly controlled by Tilling & British Automobile Traction Limited and the London & North Eastern and London Midland & Scottish Railway Companies, secured in the year ended December 31, 1933, a gross profit of £192,785 before providing for depreciation and directors' fees. The net profit, after providing for these items and for income tax reserve, was £42,676. A final dividend of 5 per cent. on the ordinary shares is recommended, making 10 per cent. for the year, and leaving £12,036 to be carried forward, as compared with £12,360 brought in. A number of omnibus businesses has been acquired during the year.

Grand Union Canal Company.

—The report for the year 1933 shows gross receipts of £248,343, against £245,134 for 1932, and working expenses of £150,574 (against £156,704), leaving a balance of £97,769 (against £88,430) to be carried to net revenue account. Including Treasury grants of £10,246 under the Development (Loans, Guarantees

and Grants) Act, 1929, total net revenue amounts to £111,124, comparing with £92,304 for 1932. The dividend on the capital stock for the whole year is to be 17s. 6d. per cent., requiring £18,896, as against 15s. per cent. for the whole year 1932. The amount to be carried forward is £12,491, compared with £9,039 brought in.

Hadfields Limited.—Earnings for 1933 were £90,857, compared with £17,283 for the previous year. After payment of debenture interest the balance carried forward is increased from £4,373 to £36,552; a year ago it was drawn on to the extent of £21,623. The actual volume of output for the year was below the normal, although there was a definite increase in trade in the last few months. The improvement in the company's position has been largely due to the reorganisations and economies effected in recent years.

Swedish Ball Bearing Company (S.K.F.).

—The directors announce that the net profit on the operations for 1933 amounted to 9,349,578 kr. (against 10,082,914 kr. for 1932), after deduction of depreciation on buildings and machinery and provision for taxes. In addition the company had a net income during the year from special sources which gave it a total net profit of 17,734,938 kr. In view of this extra profit the board proposes to increase the dividend from 7 per cent. paid for 1932 to 8 per cent., requiring 10,400,000 kr. The remainder, 7,334,938 kr., is to be transferred to undistributed profits, which will thereafter amount to 26,466,447 kr.

British Aluminium Co. Ltd.

—A net profit of £110,850 is shown for 1933, (against £122,160 for 1932). Before arriving at this figure, £15,000 (against £23,000) has been provided for taxation and £50,000 (the same) has been reserved for depreciation. A dividend of 5 per cent. is again to be paid on the ordinary shares and £52,778 is to be carried forward (against £51,980). Last year £10,000 was added to staff benefit fund. The tonnage of aluminium sold during the year was somewhat less than in the previous year owing to decreased sales in the home market. There was a serious increase in the importation of rolling mill products and competition was thereby intensified.

Ottoman Railway from Smyrna to Aidin.

—Gross receipts for the half-year ended December 31, 1933, amounted to £179,466 (against £194,158 for the second half of 1932). Expenses absorbed £118,456 (against £119,181), leaving net receipts at £61,010 (against £74,977). For the whole year gross receipts were £55,029 lower at £299,893, and expenses were £1,863 lower at £238,439. The amount available on revenue account—namely, £61,454—falls short of the sum required to meet the fixed interest for the year on the debenture

stocks by £95,593; this sum has therefore been transferred from the debenture stock interest reserve. For the preceding year the amount required for this purpose was £47,142. Efforts are still being made to reduce expenditure, and if the piastre had not appreciated a bigger decrease would have resulted. Owing to exchange restriction the company has considerable funds abroad awaiting remittance. The secretary visited Athens in November to press for payment of the amount due under the award of the Anglo-Hellenic Arbitral Tribunal.

Hoffmann Manufacturing Co. Ltd.

—At the annual general meeting of this company on March 20, the chairman (Mr. A. O. Peech) pointed out that the company continued to find fresh uses for its manufactures, and each new development in the use of machinery widened the scope for the use of ball and roller bearings. It was now dealing as a regular thing with speeds which a few years ago were considered impracticable, and the accuracy required from modern machinery in its turn called for increased accuracy in the bearings supplied. This company had been in the forefront of this development work, and its past preparations had enabled it to deal adequately with the increased demand. The board would continue its vigorous forward policy. A dividend of 7½ per cent. for the year on the ordinary shares was recommended.

Forthcoming Events

- Apr. 5 (Thurs.).—Stephenson Locomotive Society, at King's Cross Station (L.N.E.R.), London, N.1, 6.30 p.m. "From Works Apprentice to Shed Superintendent," by Mr. B. Adkinson.
- Apr. 6 (Fri.).—Institute of Transport (Leeds), at Town Hall, 6.30 p.m. Annual General Meeting.
- Institution of Mechanical Engineers, Storey's Gate, London, S.W.1., 7 p.m. Informal Meeting.
- Apr. 7 (Sat.).—Locomotivemen's Craft Guild (London), at Borough Polytechnic Inst., S.E.1., 6.30 p.m. "Safety on the Railways."
- Apr. 10 (Tues.).—Institute of Transport (Birmingham), at Queen's Hotel, 6 p.m. Annual General Meeting.
- Retired Railway Officers' Society, in Room 300, Great Eastern Hotel, Liverpool Street, London, E.C.2., 2.30 p.m. Ordinary Meeting.
- Apr. 11 (Wed.).—Permanent Way Institution (London), in Staff Dining Room, Waterloo Station (S.R.), 7 p.m. "Engineering Problems in Fenland," by Mr. B. P. Fletcher.
- Apr. 12 (Thurs.).—Institute of Metals (London), at Society of Motor Manufacturers and Traders Limited, 83, Pall Mall, S.W.1., 7.30 p.m. Annual General Meeting.
- Apr. 13 (Fri.).—Institute of Transport (Newcastle), at Royal Station Hotel, 7.30 p.m. Annual General Meeting.
- "Passenger Transport Policy," by Mr. C. A. Hopkins.
- Railway Club, 57, Fetter Lane, London, E.C.4., 7.30 p.m. "The London Chatham & Dover Railway," by Mr. C. N. Anderson.
- Apr. 14 (Sat.).—Permanent Way Institution (Manchester - Liverpool), at Temperance Inst., Southport, 3 p.m. "The Work of a Bridge Repair Gang," by Mr. R. D. Gauld.
- Apr. 16 (Mon.).—Wimbledon and District Model Railway Club, Locomotive Hall, Wimbledon Hill, London, S.W.19. "Railways of the Irish Free State," by Mr. A. W. Croughton.

G.W.R. Holiday Literature

With spring already on the threshold there will doubtless be an immediate and widespread demand for the three handsome volumes relating to our glorious West Country which have just been issued by the Great Western Railway Company. They stand for the very last word in holiday literature and artistic arrangement. Two of them have been favourites with the public for years and are now in their third edition; the other is quite new and is all about *Somerset; and when we add that the writer thereof is Mr. Maxwell Fraser, it will readily be appreciated that it is a book that should on no account be missed by the individual tourist or the family holiday-maker. It is delightfully written throughout and contains much valuable data concerning the scenic and historical features of famous "Zummerzet." The numerous photogravure illustrations are particularly charming, and that the many fine views therein will be generally praised goes without saying. A finely-coloured view of Cheddar Gorge makes an attractive frontispiece; and folded at the end is a comprehensive G.W.R. map of Somerset. Another useful section is devoted to "Where to Stay" advertisements. The book, which runs to 186 pages letterpress and 116 pages illustrations, is enclosed in a coloured cover of scenic design, and is published at 2s. 6d. cloth and 1s. paper covers.

The remaining volumes† are devoted to Devon and the Cornish Riviera respectively and both are written by Mr. S. P. B. Mais, whose descriptive powers—especially where Britain's beauty spots are concerned—have long been

* Somerset, by Maxwell Fraser.
† Glorious Devon and The Cornish Riviera, by S. P. B. Mais.

the theme of popular appraisal. In the two volumes in question Mr. Mais has excelled himself—and that is high praise. The Devon book contains a truly lovely collection of photographic illustrations of local interest with, in addition, many charming little pen-and-ink sketches of places of note, building and other. Sectional maps, too, are given here and there, whilst a frontispiece and a picture cover, both

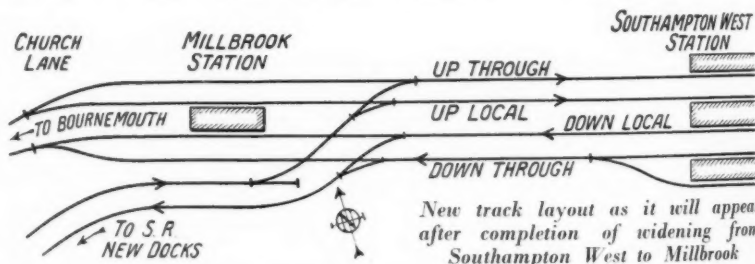
finely coloured, add to the interest of the book, whose letterpress pages number 152.

The Cornish volume, with 168 pages letterpress, is a worthy companion, and it would be difficult to decide—if a decision were called for—which is the better of the two. Numerous beautiful plates and pen-and-ink sketches abound, together with various sectional maps, and there is a striking frontispiece in colour. A seascape in blue and white makes a very effective front cover.

Southampton West to Millbrook Widening, Southern Railway

Work is to begin shortly on widening the main line between Southampton West and Millbrook, a length of 1½ miles, as shown in the accompanying diagram. This layout will entail the entire reconstruction of Millbrook station as an island platform 600 ft. long, serving the up and down local lines. The new platform, with a 200-ft. roof, will accommodate waiting rooms, booking office and parcels office, and will be reached by a new footbridge from the Millbrook Road. A little to the east of Millbrook station will be laid the new junction for the two lines which are to serve the new

docks. These two lines sweep round from the direction of the King George V graving dock and run parallel with the main lines opposite Millbrook station, where the London-bound trains from the docks will cross to the up lines. The Millbrook widening, which is estimated to cost £70,000, is linked up with the £178,000 reconstruction of Southampton West station now in progress and described, with a plan, in our issue of January 12 last, and the whole scheme will not only provide adequate facilities for traffic to the docks, but will also relieve the pressure at Southampton West.



New track layout as it will appear after completion of widening from Southampton West to Millbrook

G.W.R. Ambulance Competition, 1934

During February and March the first and semi-final rounds of the annual series of G.W.R. first aid competitions were decided. The first round consists of contests organised in each of the seventeen ambulance divisions for beginners and advanced workers respectively, for which handsome prizes in kind are awarded by the directors to about half the teams competing. The winning teams in both classes in each division (34 teams in all) have participated in the semi-final round, which has, for convenience, been held in part at Bristol, Newport, Paddington, and Birmingham, the adjudicators being Dr. I. H. Maclean, of St. Mary's Hospital, Paddington (team test), and Dr. W. J. Crawford, of Southall (individual tests). As a result the following eight teams will meet in the final contest for the Directors' challenge shield and other prizes, and to decide who shall have the honour of defending the G.W.R. title to the inter-railway

challenge shield of the St. John Ambulance Association:—Swindon, South Lambeth, Barry Locomotive Department, Pontypool Road, Weymouth, Paignton, Liskeard, and Bourne End.

The final contest will be held at

Paddington on April 27, when the adjudicators will be Major J. Orton, of Coventry (stretcher work), and Dr. Maclean (individual work). It is anticipated that Sir Robert Horne, Chairman of the company, who has recently accepted the presidency of the Great Western Railway Ambulance Centre, will preside at the subsequent presentation of trophies and prizes.

Exports of Railway Material from the United Kingdom in February

	Feb., 1934		Feb., 1933		Two Months Ending Feb., 1934		Feb., 1933	
	£	£	£	£	£	£	£	£
Locomotives, rail	34,086	126,035	59,515	174,763				
Carriages and wagons	30,748	57,943	88,850	100,616				
Rails, steel	31,929	7,423	78,751	34,962				
Wheels, sleepers, fishplates and miscellaneous materials	54,242	39,653	115,196	85,132				
Locomotive and rail exports included the following:—								
	Locomotives		Rails					
	Feb., 1934	Feb., 1933	Feb., 1934	Feb., 1933				
Argentina	—	100,867	7,836	1,460				
Union of South Africa	—	1,555	14,744	14,567				
British India	—	1,323	16,237	12,354				

NOTES AND NEWS

Greek Loan for Rolling Stock.—

The Greek Government is permitting the Peloponnesus Railway Company to obtain a foreign loan for the purpose of renewing its rolling stock. The opinion has been expressed that the loan will be raised in Germany and will probably not be negotiated in cash but in kind.

Fare Cuts in Germany.—The German State Railway announces a 75 per cent. cut in rail fares for foreign tourists, to come into operation on March 25 and to continue for a fortnight. The reduction will apply to all journeys into or through Germany, but the tickets will be issued only to travellers making a stay of seven days in the country before returning.

Canadian Railway Pooling Arrangements.—According to a statement made on March 21 by the Hon. R. J. Manion, Canadian Minister of Railways, 1,000,000 train miles and £100,000 every year will be saved by a passenger train pooling arrangement effected by the Canadian Pacific and Canadian National Railways on the Montreal-Toronto, Montreal-Ottawa, and Montreal-Quebec lines.

Middlesbrough District Railway Lecture and Debating Society.—The thirteenth annual general meeting of the above society was held in the Cleveland Scientific and Technical Institute, Corporation Road, Middlesbrough, on March 13. Mr. W. P. Allen, Dock Superintendent, Middlesbrough, presided in the unavoidable absence of the President, Mr. W. E. Blakey, District Goods Manager, Middlesbrough. The Secretary presented the annual report, which indicated that the past session had been very successful and that there had been an increase in membership. Mr. W. P. Allen presented the essay competition prizes, the first being awarded to Mr. E. Norminton, District Goods Manager's Office, Middlesbrough, for a paper entitled "L.N.E.R. Road Transport," and the second to Mr. J. McGrath, Yard Inspector, Middlesbrough, for a paper "Economic Prospects and Aspects of our Railway."

P.L.M. Night Expresses.—When the French summer time-tables come into force on May 15, the famous "battery" of 18 expresses which is despatched from the Gare de Lyon, Paris, between 7.30 p.m. and 11 p.m. will be augmented. Two new trains will leave at 11.10 p.m. and 11.20 p.m. respectively. This intense concentration of night expresses is due to the volume of long-distance passenger traffic handled by the P.L.M. The public has shown its preference for night travel for journeys of this magnitude, and it is in order to provide all areas served with convenient arrival and departure times that the trains are despatched within this four-hour period. Forty-three

expresses at present leave the Gare de Lyon daily. Of these all but 10, which serve the Saint-Etienne, Vichy, and Clermont areas, travel via the Paris-Dijon line. There are 15 day expresses from Paris to Dijon, the remainder being the night series already described.

Dynamite Train Explodes.—The sudden stopping of a goods train laden with seven tons of dynamite is given as the cause of a disastrous explosion at San Salvador, S. America, on March 15. Press messages state that the flames spread to a petrol warehouse and devastated hundreds of houses in the neighbourhood. More than 250 people are reported killed and at least 1,000 injured.

Potosi-Sucre Railway.—At an extraordinary general meeting of the members of the Antofagasta (Chili) and Bolivia Railway Company, held on Tuesday, March 20, approval was unanimously given to proposals to enable the board to come to an arrangement with the Bolivian Government in reference to the completion of a railway from Potosi, the terminus of a line worked by the company in Bolivia, to Sucre.

Demonstration House at King's Cross.—To draw attention to the type of residence available on various estates in the northern suburbs served from King's Cross station, L.N.E.R., John Laing & Sons Ltd., building contractor, has erected a specimen detached house in front of the station. The house has six rooms and a built-in garage, and is completely furnished. It will be open for inspection daily from 9.30 a.m. to 8 p.m. on and from March 24.

Fate of the Welsh Highland Railway.—It has been reported to the Portmadoc Council that a conference of representatives of local authorities which had invested money in the Welsh Highland Railway considered the question of closing down the railway. The debenture holders agreed with the Portmadoc Council that if the railway were closed sections near Portmadoc and elsewhere should be kept intact in readiness for hoped-for local quarry developments. The conference appointed a deputation to confer with the managing director of the Festiniog Railway, and also decided to ask the L.M.S.R. whether it would consider taking over the Welsh Highland Railway.

Institution of Locomotive Engineers: Awards for Papers.—We are informed by Major H. A. Harrison, Secretary of the Institution of Locomotive Engineers, that the following awards have been made for papers read before the Institution in the 1932-33 session. The first of them, the Frederick Harvey Trevithick prize (value £30), has been awarded to Mr. W. Cyril Williams, M.I.Mech.E., A.M.Inst.C.E., M.Inst.Loco.E., for his paper on

"Modern Articulated Steam Locomotives." The second award (value £5 5s.) goes to Mr. T. G. Atkinson, A.M.I.Mech.E., M.Inst.Loco.E., for his paper entitled "Feed-Water Heating on Locomotives." Mr. C. A. Cardew, M.Inst.Loco.E., of New South Wales, receives the Alfred Rosling Bennett award (value £3 3s.) for his paper on "Some Observations on the Practice of Providing Lead with the Piston or Slide Valves of Modern Locomotives"; whilst Mr. J. C. Loach's paper "The Locomotive and the Track; Aspects of their Relationship" has earned the independent award to graduates.

Another Russian Railway Accident.—A message from Moscow announces another Soviet railway collision, in which 33 passengers are reported to have been killed and 68 injured. The accident took place on March 12 at Tavatui, in the Urals, when a local passenger train passed a signal at danger and crashed into a shunting goods train. The message states that the trial of the officials involved was opened on Monday, March 19.

Summer Tickets to the Continent.—During the coming season the L.N.E.R. will extend to one month the validity of excursion tickets issued in connection with its Continental services. The tickets will be issued from Liverpool Street and certain provincial stations from March 24 to September 29 to Antwerp and Flushing, and from June 29 to September 6 to Zeebrugge. Similar excursions will be available via the Harwich-Hook of Holland service during July, August, and September. Corresponding excursion arrangements have been made for the services from Grimsby and Hull.

C.P.R. and Canadian Government.—Mr. Bennett, the Canadian Prime Minister, gave evidence on March 21 before the Banking and Commerce Committee of the Dominion House of Commons at Ottawa. He confirmed what Mr. Beatty had previously stated as to the negotiations leading up to the Government's guarantee of bank advances to the Canadian Pacific Railway. Mr. Bennett said that without Government backing a bank loan would have been impossible, and the whole credit of Canada would have been endangered if the Canadian Pacific Railway had been unable to consolidate its maturing obligations over a five-year period.

Staff Safety in U.S.A.—A reduction of almost 80 per cent. in the number of accidents to employees of the Pennsylvania Railroad has been made since 1927. The winners of the Safety Contest for 1933 were announced recently by the President of the company, Mr. W. W. Atterbury, through the medium of a poster which is being displayed on all employee bulletin boards throughout the system. The announcement calls attention to the fact that there has been a steady decrease in the number of casualties to employees per million man hours worked on the Pennsylvania Railroad during the past seven years.

In 1927 the figure was 19.1; the following year it dropped to 13; then to 10.2 in 1929. In 1930 it was 6.2, dropping to 4.5 in 1931; and to 4.4 in 1932. Last year, with an average of 110,000 employees constantly at work, the safety record showed 4.2 casualties per million man hours, which is the best safety record thus far attained on the Pennsylvania Railroad.

Irish Railway Line as Road.—On March 8, the Cork County Council decided to adopt the County Surveyor's scheme for the acquisition of the abandoned Cork Blackrock and Passage Railway for the purpose of constructing a by-pass road. It was stated that the Council's contribution for the purchase of the portion of the railway in the county would be £2,200, the Cork Corporation to purchase the portion within the borough boundary at £1,100. The total cost to the County Council of acquiring the railway and making the by-pass road was estimated at £9,000, and the County Surveyor said that there would be considerable saving in maintenance of the present Cork to Rochestown road.

The Port of Bristol.—A film lasting about an hour and a quarter dealing with the shipping facilities provided by the Port of Bristol Authority at its City, Avonmouth, and Portishead docks was exhibited at the Merchants' Hall, Baltic Exchange, London, on March 20 before a large number of ship-owners, manufacturers, and others interested in overseas trade. The film showed in a very convincing manner the magnitude and range of the port's activities, and its capacity and ability to deal with a wide range of imported and exported goods. An interesting feature was the important part played by the Great Western Railway, and to a lesser extent by the L.M.S.R., in providing the necessary arteries of transport into the port's extensive hinterland. Alderman E. M. Dyer, Chairman of the Port Authority, presided.

Ex-British Westinghouse Association Re-Union.—The fifteenth annual dinner of the Ex-British Westinghouse men was held at the Trocadero Restaurant, London, on March 16, nearly 150 members attending from London, the provinces and abroad. Indisposition prevented Prof. Miles Walker from presiding, but Mr. G. A. Trube, who was over from Paris, consented to take the chair. Mr. Trube, in replying to the toast of "The Association," proposed by Mr. J. C. Whitmoyer, read from Prof. Miles Walker a message of cheer to the association members in particular, and to electrical engineers in general. He stressed the importance of engineering to the whole world to-day more, especially as an instrument for obtaining and securing international peace. The "Silent Toast" to the memory of members who had "passed on," during the year in particular, referred to no fewer than ten names. The usual "draw" for life membership took place, and Mr. J. Moon was the winner. The three members of the committee retiring in rota-

tion, Messrs. Dick, Hughes and Warrilow, were unanimously re-elected.

Opening of New Osterley Station.

—On Sunday, March 25, a new station, situated on the Great West Road at Osterley, was opened to traffic. The existing station in Thornbury Road was closed after traffic on Saturday night. This new station, which is on the Hounslow branch, District Line, London Passenger Transport Board, is of modern design, constructed in multi-coloured bricks with a sign tower, surmounted by a concrete and glass lighting beacon. The height of the tower and beacon is about 70 ft. above the level of the Great West Road. The existing station in Thornbury Road was opened in 1883.

Bekonscot Miniature Railway.

—From April to October the public will again have an opportunity to inspect the Bekonscot miniature village and railway, Beaconsfield, Bucks. An admission fee of one shilling is charged, the proceeds being devoted to the Railway Benevolent Institution. The railway may be seen working every Sunday from 2 p.m. to 7 p.m. and between the same times on the first Saturday of each month. The village is open on other afternoons, but the trains run only as above. The Bekonscot miniature railway, which is three minutes' walk from Beaconsfield station, G.W. & G.C. Joint, was illustrated and described in *THE RAILWAY GAZETTE* of March 31, 1933.

Railways Athletic Association.

—The annual five miles cross-country race of the railways took place on Saturday, March 17, from the Royal Air Force Depot, Ruislip, Mr. H. S. Chapman (London Passenger Transport Board) officiating as starter. The following were the results:—Individual order of finish—1st, W. J. Beavers (L.N.E.R., York), 26 min. 31 sec.; 2nd, D. Phillips (G.W.R., Newport); 3rd, R. Allison (L.M.S.R., Glasgow). Provincial area championship (for Sir Herbert Walker's silver bowl):—1st, G.W.R., Newport; 2nd, L.N.E.R., York; 3rd, L.M.S.R., Crewe. London area championship (for late Mr. A. E. Bolter's cup)—1st, District Line; 2nd, Southern Railway; 3rd, L.M.S.R. Railway Group Championship (for "Buchanan" Shield):—1st, G.W.R.; 2nd, L.M.S.R.; 3rd, L.N.E.R. The winner of Sir Herbert Walker's challenge bowl for the first Southern Railway competitor finishing in the race was B. A. Burton, Engineer's Department, Croydon. The trophies were presented to the successful competitors by Mr. W. A. Stanier (L.M.S.R.).

G.W.R. Camping Coaches.

—The Great Western Railway has converted nineteen of its obsolete coaches into holiday bungalows for use by camping parties during the summer. The coaches have been allocated to various parts of Somerset (1 coach), Devon (6 coaches), Cornwall (3 coaches), and Wales (9 coaches). They will be stationed in sidings at picturesque spots some distance from the main line, and are

available for parties of six persons at a cost of ten shillings per head per week. One coach has been fitted up with ten berths and can be hired at a slightly higher rental. A very complete equipment of crockery, cutlery, bedclothes, table linen and other camping necessities is provided without extra charge.

Road and Rail Season Ticket Conference.

—The Northern Area Traffic Commissioners, at Aberdeen, agreed recently that in order to reach some standardisation in the matter of season tickets and tickets for workers, a conference should be held in Aberdeen between bus operators, the L.N.E.R., representatives of workmen, and officials of the Northern Area Traffic Commissioners.

The Model Railway Exhibition.

—The Model Railway Club is holding its annual exhibition at the Central Hall, Westminster, from Tuesday, April 3, until Saturday, April 7. The exhibition will be open to the public daily from 11 a.m. to 10 p.m., except on Tuesday, when the doors will be opened at 2 p.m. All the popular features of past years, including the French section, are being retained, and many new models will be on view. A special attraction will be the free showing in the exhibition cinema of the film of the Royal Scot's American tour.

Railway Air Services Limited.

—The company which is to operate air services in conjunction with the four main-line railway companies was incorporated under the title Railway Air Services Limited, on March 21, with a nominal capital of £50,000 in £1 shares. The directors are to number not fewer than five nor more than 10, of whom five will be appointed by the Great Western, London & North Eastern, London Midland & Scottish and Southern Railways and Imperial Airways. The qualification is 100 ordinary shares. The registered office is Airway Terminus, Victoria Station, S.W.1. Brig.-Gen. Sir Harold Hartley, a Vice-President of the L.M.S.R., will be Chairman of the new company. (See editorial on p. 534.)

M. & G.N. Joint Railway Ambulance Competitions, 1934.

—The shield competition was held at Wisbech on March 1. Teams from Melton Constable, Norwich, Sheringham, Fakenham, Moulton, and Holbeach competed, Norwich being the winners and Sheringham the runners-up. The shield and prizes were presented to the winning teams by the Mayor of Wisbech (Mr. Jos. Smith), who was thanked by Mr. R. B. Walker, Traffic Manager. The judge was Dr. W. A. Layard Marriott, of Norwich. The cup competition was held at Norwich on March 7. Seven teams competed from Yarmouth, Cromer, Melton Constable, South Lynn, Wisbech, and Sutton Bridge (2). The judge was Dr. R. B. Duncan, of London, and he placed South Lynn first and Wisbech second. The cup and prizes were presented to the winners by Mrs. E. J. Motum, to whom a vote of thanks was passed by Mr. R. B. Walker.

Memorial Service for Lord Faringdon.—A memorial service for Lord Faringdon was held on Friday, March 23, at St. Michael's Church, Cornhill, E.C., Prebendary Ellison, Rector of St. Michael's and Honorary Chaplain to the Stock Exchange, officiating. Members of the family attended and the congregation included the following:—

Sir Archibald Campbell, Chairman, and Mr. R. B. Pearson, Deputy Chairman, of the Stock Exchange; Lord Plender; General the Hon. Sir Herbert Lawrence, Director, L.M.S.R.; Sir Alexander Butterworth; the Uruguayan Chargé d'Affaires; the Hon. Arthur Crichton; Mr. H. J. Binder, representing Mr. B. H. Binder, Chairman of the Paraguay Central Railway; and Director of the Argentine North Eastern and Entre Rios Railways; Mr. Edwin A. Clear, President of the Retired Railway Officers' Society, and formerly of the Great Central Railway; Mr. W. R. Stevens, representing Mr. W. J. Stevens; Mr. F. P. Higgs, Secretary, Great Southern of Spain Railway Company. The London & North Eastern Railway Company was represented by Mr. William Whitelaw, Chairman; Sir Charles Batho, Mr. A. R. Gray, Mr. Ronald W. Matthews, and Sir Christopher Needham, Directors; Mr. James McLaren, Secretary; Mr. C. J. Selway, Passenger Manager, Southern Area; and Mr. P. Syder, London City Manager. The Chairman, Directors, General Manager and Officers of the Great Western Railway Company were represented by Mr. S. B. Collett, Assistant Secretary.

South American Railway Companies were represented by:—Messrs. A. W. Bolden, Chairman, Antofagasta (Chili) & Bolivia; G. R. Cable, Director, Central Uruguay; G. L. Clarke, Buenos Ayres Midland; Norman B. Dickson, Director, Great Western of Brazil, Leopoldina, and Taltal; J. M. Eddy, Director, Buenos Ayres Great Southern and Buenos Ayres Western; Felix Fighiera, Secretary, Central Argentine; D. R. Finnis, Secretary, Taltal; H. M. Greenwood, Deputy-Chairman, Taltal; A. J. Medlycott, Secretary, Great Western of Brazil; C. H. Pearson, Director, Central Argentine, and Taltal; George Steven, Buenos Ayres Western.

Photographs from "The Times" Presented to G.W.R.—*The Times* has presented to the Great Western Railway a series of 14 large photographs, which have been hung in the new combined waiting-room and tea-room on No. 1 platform at Paddington. The formal presentation was made on Friday last, by Major Astor, M.P., Chairman of The Times Publishing Company Limited and acknowledged by Sir Robert Horne, M.P., Chairman of the Great Western Railway Company. The pictures illustrate scenes in parts of the country served by the G.W.R. They are enlarged from photographs, the work of staff photographers, which have appeared in the pages of *The Times*. In handing over the photographs, Major Astor expressed the hope that they would increase public interest in the beautiful places in England and Wales which they depicted and so might help to encourage railway travel. Sir Robert Horne, returning thanks for the gift, said that *The Times* had already done notable service in drawing attention to the British scene, and no more artistic work had come from the camera than these pictures. Among those representing the G.W.R. at the ceremony were Lord Palmer, Mr. Edward Cadogan, M.P., Mr. A. G. Hubbard, Mr. R. Cope, and Mr. F. R. E. Davis. The representatives of *The Times* included Mr. Ralph Walter, Sir John Pybus, M.P., Mr. Geoffrey Dawson, Mr. C. S. Kent, Mr. U. V. Bogaerde and Mr. W. R. Williamson.

L.N.E.R. Bohemian Concert.—At the L.N.E.R. Musical Society's Bohemian Concert, at the Hamilton Hall, Liverpool Street Hotel, on Friday last, the chair was occupied by Lady Landon Ronald. Sir Landon, who accompanied

her, kindly consented to conduct the Overture to "Die Meistersinger," and also to accompany Miss Dorothy Greene in one of her solos. As a tribute to the late Lord Faringdon, the concert was preceded by impressive renderings of Purcell's "When I am Laid to Earth" and Sullivan's "The Long Day Closes," during which the large audience stood. The evening's programme, provided by the Society's choir and orchestra, under the conductorship of Mr. Leslie Woodgate, was received by an appreciative audience. Mr. W. Whitelaw, Chairman of the L.N.E.R., was among those

present, and was supported by Sir Charles Batho, Sir Murrough Wilson, and Mr. H. T. Bailey, Directors.

Traffic Percentages.—In the Editorial Note at p. 481 of *The Railway Gazette* of March 23, on "The Week's Traffics," the percentages of increases for the 11 weeks of the current year were inadvertently placed in the wrong order. The right order of the percentage increases should have been:—

G.W.R.	..	..	+ 5.60
L.M.S.R.	..	..	+ 6.46
L.N.E.R.	..	..	+ 9.08
S.R.	..	..	+ 3.57

G.W.R. Concert

For the fifteenth successive year the Great Western Railway (London) Musical Society held its annual concert last Friday at the Queen's Hall, under the chairmanship of Lord Palmer (Vice-Chairman of the G.W.R.), supported by Sir Robert Horne (Chairman of the G.W.R.), and a representative gathering of directors and officers. The Swindon Choir and Orchestra co-operated with the London Musical Society, and, together with a number of well-known professional artists, put up a

highly creditable performance, which was much enjoyed by the large audience, who also appreciated the many respectful references to the Secretary of the Concert Committee by Mr. Gillie Potter. The chief works performed by the combined choir and orchestra were Mendelssohn's "The First Walpurgis Night" and "Hail Bright Abode" from Wagner's "Tannhauser." The choir, accompanied by the orchestra, also sang three very effective part songs by Elgar. Mr. W. H. Reed conducted.

G.W.R. Units, R.E. (S.R.) Dinner

Last Saturday the sixth annual dinner and smoking concert of the Great Western Railway Units of the Royal Engineers (Transportation Units, Supplementary Reserve) was held at Chiltern Hall, Baker Street station, under the presidency of Lieut.-Colonel F. T. Bowler, R.E. (S.R.). Among the 270 present were the following:—

Lt.-Col. F. T. Bowler, R.E. (S.R.), Commanding 151st (G.W.) Railway Construction Company; Captain P. J. Cator, R.E., Adjutant, S.R., Longmoor; Lt.-Col. R. Carpmal, Chief Engineer, G.W.R.; Mr. A. C. Cookson, Stores Superintendent, G.W.R.; Mr. F. R. E. Davis, O.B.E., Secretary, G.W.R.; Major E. T. Davies, M.C., Assistant Divisional Engineer, Paddington, G.W.R.; Major R. F. O'D. Gage, M.C., R.E., Longmoor; Major F. Holland, R.E. (S.R.), Commanding 152nd (G.W.) Railway Construction Company, The Rt. Hon. Sir Robert Horne, G.B.E., K.C., M.P., Chairman, G.W.R.; Mr. J. W. S. Kislbury, Divisional Locomotive Superintendent, G.W.R.; Mr. F. W. Lampitt, Development Agent, Goods Department, G.W.R.; Mr. J. F. Lean, Principal Assistant to the General Manager, G.W.R.; Captain J. F. M. Leese, R.E., War Office; Major D. J. McMullen, D.S.O., R.E., Chief Instructor, Longmoor; Lt.-Col. L. Manton, D.S.O., O.B.E., R.E., Commandant R.T.C., R.E., Longmoor; Mr. A. S. Mills, London District Goods Manager, G.W.R.; Major A. S. Quartermaine, M.C., Assistant Chief Engineer, G.W.R.; Col. W. G. Tyrrell, D.S.O., R.E., A.D. Transportation, War Office; Major S. E. Tyrwhitt, R.E. (S.R.), Commanding 154th (G.W.) Railway Operating Company; Mr. G. J. Walker, Hotels Manager, G.W.R.; Mr. F. C. Warren, Engineer's Department, G.W.R.; Mr. W. A. Willox, *The Railway Gazette*; and Major G. R. S. Wilson, R.E., Longmoor.

Sir Robert Horne, replying to the toast of "The Great Western Railway," which had been proposed by Major F. Holland, expressed his pleasure at being present as Chairman

of the Great Western Railway, the staff of which had such a fine tradition of loyalty to the company and courtesy to its patrons. Major Holland had referred to the lifting of the clouds which had cast a shadow over railway fortunes, and, although matters were undoubtedly improving, Sir Robert Horne emphasised the need for continuous effort to overcome the leeway which still had to be made up even to the prosperity level of 1929.

Colonel W. G. Tyrrell responded to the toast of "The Regular Army," proposed by Lieut.-Colonel Bowler, and said how highly the War Office appreciated the willing co-operation between the railways and the army, and that the value of the Transportation Units was fully recognised.

Lieut.-Colonel Manton, proposing the toast of "The Supplementary Reserve," said that the presentation by Sir James Milne, General Manager of the G.W.R., of a cup to be contended for by the Transportation Units—which had previously been announced by Lieut.-Colonel Bowler—would add to his other burdens that of adjudicating between the Units, but it was a duty which, though difficult, he would gladly undertake. Major Tyrwhitt replied.

Lieut.-Colonel Bowler in a graceful speech proposed the toast of "The Visitors," which Mr. F. R. E. Davis and Mr. Carpmal acknowledged in terms of appreciation at the hospitality and the excellent entertainment provided. The proceedings concluded with three cheers for Lieut.-Colonel Bowler for his able chairmanship.

OFFICIAL NOTICES

THE Proprietor of British Patents Nos. 196,577 and 209,110, dated April 24, 1922, relating to Improvements in Locomotives, and Patent No. 209,111, dated April 24, 1922, relating to Improvements in Turbine Electric Locomotives, is desirous of entering into arrangements by way of a license or otherwise on reasonable terms for the purpose of exploiting the above Patents and ensuring their practical working in Great Britain. Inquiries to Mr. B. Singer, Chrysler Building, New York City, N.Y., U.S.A.

PATENTS for Inventions, Trade Marks, Advice, Handbook, and consultations free. King's Patent Agency, Ltd. (B. T. King, C.I.M.E., Registered Patent Agent, G.B., U.S., and Canada), 146a, Queen Victoria Street, London, E.C.4. 49 years' references. 'Phone City 6161.

OFFICIAL ADVERTISEMENTS.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

CONTRACTS AND TENDERS

Sir W. G. Armstrong, Whitworth & Co. (Engineers) Ltd. has secured an order from the Government of India, India Store Department, for two 1,300-b.h.p. diesel-electric locomotives for the North Western Railway of India to the inspection of Messrs. Rendel, Palmer & Tritton. These locomotives, the call for tenders for which was announced in the issue of *THE RAILWAY GAZETTE* for October 6, 1933, in this column, and again in the issue for December 1, 1933, are designed for working the Lahore-Karachi mail service.

John I. Thornycroft & Co. Ltd. has just received the 48th repeat order from the L.N.E.R. for a further four Handy two-tonners, making thirty-five in all to be ordered quite recently.

Nasmith Wilson & Co. Ltd. has secured orders for locomotive boilers as follow: Two boilers for class G/S superheated 4-8-0 type locomotives for the Madras & Southern Mahratta Railway and one boiler for class G saturated 2-8-2 type locomotive for the North Western Railway of India.

Further to the announcement in this column of *THE RAILWAY GAZETTE* for February 9 that the Government of India, Railway Department, had placed orders with Burn & Co., Braithwaite & Co. and Jessop & Co. for the 1934-35 requirements of broad and metre gauge I.R.S. wagons for the Indian State Railways, the following details of these orders are now available:—

Burn & Co.: 100 CR wagons for B.B. & C.I. Railway, 200 CR wagons for E.B. Railway and 345 CR wagons for G.I.P. Railway, all at Rs. 3,702 each; 100 CMR wagons for B.B. & C.I. Railway, at Rs. 4,598 each; 50 CMR vacuum braked wagons at Rs. 4,593 each, and 50 CMR piped wagons at Rs. 4,481 each for East Indian Railway; 50 CMR wagons for G.I.P. Railway at Rs. 4,598 each; 80 CMR wagons for M. & S.M. Railway at Rs. 4,591 each; 175 O vacuum braked wagons at Rs. 3,080 each and 175 piped only at Rs. 2,970 each for E.I. Railway; 200 O wagons at Rs. 3,102 each for B.N. Railway; 65 O wagons at Rs. 3,102 each for M. & S.M. Railway; 72 O wagons at Rs. 3,109 each for S.I. Railway; 160 OM wagons at Rs. 3,575 each for M. & S.M. Railway; 9 motor vans at Rs. 6,599 each for B.N. Ry.; 5 TP tank wagons at Rs. 9,065 each for G.I.P. Railway; 5 TP tank wagons at Rs. 9,304 each for S.I. Railway; 6 TO tank wagons at Rs. 7,610 each for G.I.P. Railway; 10 BVG brake vans at Rs. 5,175 each for E.B. Railway; 9 MBVG brake vans at Rs. 5,384 each and 2 MBW bogie well wagons at Rs. 15,500 each for M. & S.M. Railway.

Jessop & Co.: 275 vacuum braked CR wagons at Rs. 3,693 each and 275 piped CR wagons at Rs. 3,581 each for E.I. Railway; and 210 CR wagons at Rs. 3,697 each for South Indian Railway.

Braithwaite & Co.: 300 O wagons at Rs. 3,047 each for B.N. Railway.

Braithwaite & Co. (Engineers) Ltd. has received a contract from the Argentine Federal Government for the supply

and erection of steel bridgework to carry metre gauge single track railway on the Patagones-Lake Nahuel-Huapi line. About 1,800 tons of steelwork will be required and the total value of the contract amounts to between £35,000 and £40,000. There are to be seven spans of 21.2 metres each, six of 52 metres each, and one of 70 metres. The bridges are for crossings of the rivers Comallo, Pilcanigen, Lafragua, Pichileufu and Niriuhau.

The Egyptian State Railways Administration has recently placed orders as follow:—

The London Plywood & Timber Company: 850 Birchwood panels, three-ply, 5 ft. by 4 ft. by 1 in. Total cost (258 ls. 2d. for delivery f.o.b. London).

British Insulated Cables Limited: Switchcords and plugs. (E.S.R. 34,128, items 1 to 15 and 21 to 24, list A.) Total cost £164 9s. delivery f.o.b. Liverpool or Birkenhead.

Standard Telephones & Cables Limited: Switchcords and plugs. (E.S.R. 34,128, items 16 to 20 and 26 to 29, list A.) Total cost £101 10s., delivery f.o.b. London.

The Phoenix Telephone & Electrical Works: Switchcords and plugs. (E.S.R. 34,128, items 1 to 4 and 8, list B.) Total cost £360 10s. 9d., delivery f.o.b. London.)

H. J. Skelton & Co. Ltd.: 4,000 mild steel joists. Total cost £931 13s. 3d., delivered f.o.b. Antwerp.

Stewarts and Lloyds Limited, Tube Investments Limited and The British Mannesman Tube Co. Ltd. have successfully concluded negotiations with the Soviet Government for a large contract for steel tubes of all descriptions, totalling upwards of £1,000,000 in value. These firms between them control approximately 90 per cent. of the tube trade of Great Britain and it is probably true to state that the successful outcome of these negotiations may be largely attributed to the trade agreement recently concluded between the U.S.S.R. and Great Britain.

The South African Railways and Harbours Administration has recently placed the following orders to the values stated:—

North West Rivet, Bolt & Nut Co. Ltd.: Tee-headed bolts, £380 16s.

Henricot Steel Foundry: Cast-steel check rail chairs and buttresses, £17,435 8s.

Usines Acieries Allard: Cast-steel check rail chairs and buttresses, £3,202 16s.

Bayliss, Jones & Bayliss Limited: Coach screws, £8,837.

Whereas on previous occasions at least part of the business has gone to Poland, the Swedish State Railways Administration has placed contracts in Great Britain for the supply of the whole of the 194,000 tons of coal required. The prices vary from 16s. 1½d.

to 18s. 10d. a ton, and the brands ordered are Lampton, South Hetton, Borden, Broomhill, Hastings, West Hartley Main, Maude, D.C.B., New Biggin, Bentinck, Wemyss, Cowdenbeath, and Townely. Originally the State Railways Administration wished to buy only 144,000 tons of coal, but has ordered an additional 50,000 tons to make up the quantity stipulated for in the Anglo-Swedish trade agreement. This additional order is based on a barter arrangement with a Newcastle firm, which is taking payment in Swedish timber.

The Egyptian State Railways Administration invites tenders, receivable by the Chief Inspecting Engineer, 41, Tothill Street, London, S.W.1, for 8,715 kilos of round brass bars.

The Chinese Government Purchasing Commission invites tenders from British manufacturers for structural steelwork and details for railway machine shops at Canton, and four overhead travelling cranes.

Tenders are invited, receivable by April 4, by the Chairman of the Tender Board, South Africa House, Trafalgar Square, London, W.C.2, for 50,000 cast-iron brake blocks for urgent delivery for the South African Government Railways and Harbours requirements.

The South African Railways and Harbours Administration is calling for tenders, to be presented in South Africa by May 7, for the supply of brake and clutch linings for road vehicles. Firms desirous of offering material of United Kingdom manufacture can obtain the further details from the Department of Overseas Trade.

The South African Railways and Harbours Administration is calling for tenders, to be presented in South Africa by May 21, for the supply of five or more two-ton and five or more five-ton four-wheeled welded frame road trailers. Further details of this call for tenders can be obtained upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. Reference number G.Y. 13605 should be quoted.

CHARTERED STRUCTURAL ENGINEERS.—The King has approved the granting of a Royal Charter of Incorporation to the Institution of Structural Engineers. The announcement of the Incorporation was made by Major A. H. S. Waters, at the Institution's annual dinner at the Dorchester Hotel, on March 23.

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